RELATIONSHIP BETWEEN CREATIVE EXPRESSION AND ACQUISITION OF LITERACY SKILLS AMONG PRESCHOOLERS IN PUBLIC EARLY CHILDHOOD CARE CENTRES IN ELEME LOCAL GOVERNMENT AREA

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Abstract

This study is focused on the relationship between creative expression and acquisition of literacy skills among preschoolers in Public Early Childhood Care Centres in Eleme Local Government Area. The study adopted the correlational research design. Two purposes, two research questions and two hypotheses guided the study. 2071 preschoolers found in 21 Public Early Childhood Care Centre in Eleme Local Government Area constituted the population of this study, from where 890 preschoolers representing approximately 43% of the population were sampled using simple random sampling technique through balloting-with-replacement. The instrument that was used for data collection was the researcher-designed 22 items questionnaire titled: Creative Expression and Acquisition of Literacy Skills Questionnaire (CEALSQ). Pearson Product Moment Correlation was used to answer the research questions and to test the hypotheses at 0.05 level of significance. The study revealed that, there is significant relationship between painting, scribbling and preschoolers' acquisition of literacy skills in Public Early Childhood Education Centres in Eleme Local Government Area. Based on the findings, it was recommended that: preschoolers should be given appropriate materials to use in painting exercises to enable them acquire the necessary literacy skills. Preschoolers should be given materials, rough papers to scribble in order to acquire proper sense of letters and number formation.

Keywords: *Creative Expression, Literacy Skills, Preschoolers*

Introduction

The Early Childhood Education Centres are learning facilities put in place to enable preschoolers have organized learning and development under the auspices of the caregivers. It is necessary that being at the centre, every preschooler should be able to acquire and develop all milestones and skills needed for future learning, since the early childhood stage serves as the cradle for growth and development. Literacy skills acquisition stands at the core of education, serving as the foundation for communication, critical thinking, and lifelong learning. UNESCO (2017) recognizes literacy as a complex set of abilities that involve not only written information but also critically evaluating and creating content. In this work, literacy skills is seen to manifest as preschoolers' ability to; identify letters, differentiate between two distinct sounds, phonemic awareness and blending of sound to form words. Basically, literacy skills in a child, involves their ability to identify letters, differentiate between two distinct sounds blend two or more letters together to make meaning. The first stage of literacy development is ability of nursery school preschoolers to identify letters. The identification of letter, such as capital letters and small letters in a word is an essential literacy skill. By being able to identify the capital and small letters preschoolers increase their ability to notice such letters eventually in familiar words (e.g., the first letter in their name, letters in other familiar words or names).

Another important literacy skill to be required by preschoolers is phonemic awareness. Phonemic awareness is the ability of a child to differentiate between two distinct sounds. And this involves the teacher stretching out each sound, practically when the teacher says a word the pupils repeat the sounds. For example, the teacher says a three- or four-phonemic word such as cat or lamp. Preschoolers play a clapping game with the teacher or another child. They clap or touch hands as they say the individual sounds in the word. The blending of letters is a skill needed to slide sounds together in order to pronounce words correctly.

According to Joe (2022), beginner readers find it difficult to hear how a group of separate sounds are blended to form a word, would not be able to pronounce words or read sentences. Simply put, the blending skill is the act of breaking words apart into their sounds. Firstly, when preschoolers hear a word they will first have to break the word into its component sounds, after which they blend the sounds together to form the word been studied. When spelling a word, the preschoolers

will have to conceive the word in their mind, and then break it down into its component sounds, in order to identify the letters needed to spell those sounds. It is observed by the researchers that some preschoolers in public primary schools fall short of literacy skill acquisition. That is to say, they do not develop literacy skills as early as some of their peers. This could have been influenced by different factors; chief amongst them is use of creative expressions by pupils.

Creative expression is the process of making or producing something that is both novel and valuable. It involves the capacity to think outside of conventional frameworks and to bring into existence new forms or configurations that have aesthetic or functional value. On this note, Robinson (2016) sees creative expression as the act of turning new and imaginative ideas into reality. It involves seeing the world in new ways, finding hidden patterns of doing things, making connections between seemingly unrelated concepts and ideas, and providing solutions. Furthermore, Gardener (2021) recounted that creative expression refers to the ability to create work that is both original and appropriate. It can manifest in various domains, including the arts, sciences, and everyday life. It is a complex activity based process that combines originality, imagination, and innovation to getting a finish end. Furthermore, Mihaly (2022), views creative expression as any act, idea, or product that changes an existing domain or that transforms an existing domain into a new one. What counts is whether the novelty he or she produces is accepted for inclusion in the domain of learning.

In the view of Sean (2021), creative expressions like drawing, painting, and scribbling allow preschoolers to communicate their ideas and emotions non-verbally. These activities help them articulate thoughts and feelings they might not yet have the vocabulary to express verbally. Engaging in other creative expression such as cutting, gluing, and coloring helps preschoolers develop fine motor skills. These skills are essential for writing and other tasks requiring hand-eye coordination.

Painting helps the preschooler develop symbolic thinking, which is foundational for literacy. When preschoolers paint, they learn to represent objects, ideas, and stories through visual symbols, which parallels the way written language represents spoken words and concepts. Also, Stanley (2018) argued that painting encourages narrative thinking and storytelling in young preschoolers. As preschoolers create paintings, they often narrate what they are depicting, thus practicing oral

language skills and laying the groundwork for written narrative skills. However, Jerome (2015) suggested that painting can serve as a medium for young preschoolers to explore and express their understanding of the world. This form of expression aids cognitive development and language acquisition, as preschoolers describe and discuss their artwork. Halliday (2017) posits that painting activities can enhance literacy skills by integrating visual and verbal modalities. Preschoolers' interactions with their own paintings and others' artworks can enhance their ability to interpret and create meaning out of what they have done, and foster skills that are transferable to reading and writing. Furthermore, Freire (2022) emphasized that when preschoolers paint, they engage in pre-writing activities, developing fine motor skills and understanding the concept of representation, which are crucial for writing development. Freire argues that painting helps preschoolers use language for different functions, such as describing, narrating, and explaining, which are important for literacy.

Painting allows children to differentiate shapes, sizes, and colors, which supports visual discrimination which is an important skill for distinguishing letters and words in print. Children learn to observe spatial relationships, such as left-to-right and top-to-bottom orientations, which are fundamental to reading and writing (Neumann, 2016). The act of painting requires children to coordinate their vision with their hand movements, improving hand-eye coordination. This skill is crucial for tasks such as copying text, spacing letters appropriately, and eventually developing fluent handwriting (Gerde et al., 2015). Furthermore, Brian (2020), noted that fine motor activities, such as painting, directly influence a child's ability to develop writing fluency, an essential component of early literacy development.

Scribbling is considered as exploratory writing, where preschoolers experiment with creating shapes and lines. Scribbling helps preschoolers understand the symbolic nature of writing. Through this activity, they learn about letter formation, directionality, and the concept that written symbols can represent spoken language. Kress (2023) sees scribbling as a multimodal form of communication that combines visual and textual elements. Kress argued that scribbling is a crucial step in literacy development, where preschoolers express their thoughts in what can be called unintelligent lines. Scribbling help preschoolers understand the interplay between different modes of communication, such as visual and textual, enhancing their ability to interpret and create

meaning through various forms. Joshua and Okogba (2024) maintained that scribbling is a pre-writing activity that upon which other literacy skills of preschoolers are hinged.

In the view of Brian (2020), scribbling is defined as an exploratory activity where preschoolers create marks that resemble writing. As such, Brian highlighted the role of scribbling in helping preschoolers develop the fine motor skills necessary for writing and to begin understanding the connection between written symbols and their meanings. On the other hand, Sucic (2017) sees scribbling as a precursor to writing, where preschoolers experiment with making marks on paper. Sucic further emphasizes the importance of scribbling in early literacy development. It allows preschoolers to practice the physical aspects of writing and to begin understanding the symbolic nature of written language. Furthermore, Neuman (2020) views scribbling as an early form of writing where preschoolers make marks that represent their thoughts and ideas. Over time, scribbles evolve into recognizable shapes, patterns, and eventually letters. It provides opportunity for them to practice making marks and to begin understanding that writing is a tool for communication. The way preschoolers acquire literacy skills cannot be done without a pronounced theory backing it. Research by Rowe (2018) suggests that early exposure to free-form writing activities aids in letter recognition and the ability to form words, which are critical components of literacy development. Scribbling require controlled hand movements, which strengthen the small muscles in children's fingers, hands, and wrists. These fine motor skills are essential for grasping writing tools and forming letters accurately (Puranik & Lonigan, 2014). Engaging in activities such as finger painting, using crayons, or making brushstrokes prepares children for the mechanics of handwriting.

This work is hinged on theory of reading acquisition by Uta Frith (1985). In Frith's theory, preschoolers acquire literacy by moving through particular stages that are developmental and associated with both age and experience. Frith include three stages of reading acquisition in the model. The first stage, the logographic stage, is characterized by instant recognition of symbols, images, or words. In the second stage, the alphabetic stage, preschoolers begin to use letter symbols to represent the sounds they hear in individual words. Preschoolers in this stage demonstrate an emerging understanding of sound and symbol relationships. The third stage, preschoolers begin to blend sounds and commence reading.

This theory is considered relevant to the study as literacy skill involves the recognition of symbols, images and words which could be acquired through painting and drawing. The theory holds that preschoolers develop literacy skill as they begin to associate letter symbols with sounds. This in effect help them build the ability to read and write which are major determinant of literacy skill. However, the researchers observed that some preschoolers seem not to exhibit the required literacy skills expected despite the effort of caregivers. It is therefore necessary to ask; could it be that these preschoolers do not carry out creative expression? What then is the relationship between creative expression and acquisition of literacy skills among preschoolers?

Purpose of the Study

The main purpose of the study is to examine the relationship between creative expression and literacy skills acquisition of preschoolers in public early childhood education centres in Eleme Local Government Area of Rivers State. Specifically, the study will;

1. Determine the relationship between painting and the acquisition of literacy skill by preschoolers in public early childhood education centres in Eleme Local Government Area of Rivers State.
2. Ascertain the relationship between scribbling and the acquisition of literacy skills by preschoolers in public early childhood education centres in Eleme Local Government Area of Rivers State.

Research Questions

The following research questions guided the study:

1. What is the relationship between painting and acquisition of literacy skills by preschoolers in early childhood education centres in Eleme Local Government Area?
2. What is the relationship between scribbling and acquisition of literacy skills by preschoolers in early childhood education centres in Eleme Local Government Area?

Research Hypotheses

The following research hypotheses was tested at a significant level of 0.05

1. There is no significant relationship between painting and the acquisition of literacy skills by preschoolers in public early childhood education centres in Eleme Local Government Area.
2. There is no significant relationship between scribbling and acquisition of literacy skills by preschoolers in early childhood education centres in Eleme Local Government Area

Research Methods

This study was carried out in early childhood education centres in Eleme Local Government Area of Rivers State. It focused on relationship between creative expression and literacy skills acquisition of preschoolers in public early childhood education centres in Eleme Local Government Area of Rivers State. Two objectives, two research questions and two hypotheses guided the study. The research design adopted for this study was the correlational research design. 2071 preschoolers found in 21 Public Early Childhood Care Centre in Eleme Local Government Area will constitute the population of this study. This is because the preschoolers are those who carry out creative expression; and they also are the ones to acquire literacy skills. 890 preschoolers representing approximately 43% of the entire population constitutes the sample size for the study using simple random sampling technique through balloting-with-replacement. The instrument that was used for data collection in this study was the researcher-designed 22 items questionnaire which was validated and titled: Creative Expression and Acquisition of Literacy Skills Questionnaire (CEALSQ). Pearson Product Moment Correlation was used to answer the research questions and to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: What is the relationship between painting and preschoolers' acquisition of literacy skills in public Early Childhood Centres in Eleme Local Government Area?

Ho_1: There is no significant relationship between painting and preschoolers' acquisition of literacy skills in Public Early Childhood Centres in Eleme Local Government Area.

Table 1: Summary of Pearson Product Moment Correlation on the relationship between painting and preschoolers' acquisition of literacy skills

		Painting	Preschoolers' acquisition of literacy skills
Painting	Pearson Correlation	1	.810**
	Sig. (2-tailed)		.000
	N	877	877
Preschoolers' acquisition of literacy skills	Pearson Correlation	.810**	1
	Sig. (2-tailed)	.000	
	N	877	877

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1 shows that the p-value of Pearson's Product Moment Correlation between painting and preschoolers' acquisition of literacy skills as .000 which is less than 0.05. Therefore, the null hypothesis one is rejected and therefore stated thus: there is a significant relationship between painting and preschoolers' acquisition of literacy skills in public early childhood centres in Eleme Local Government Area.

Research Question 2: What is the relationship between scribbling and preschoolers' acquisition of literacy skills in public Early Childhood Centres in Eleme Local Government Area?

Ho_2: There is no significant relationship between scribbling and preschoolers' acquisition of literacy skills in public Early Childhood Centres in Eleme Local Government Area.

Table 2: Summary of Pearson's Product Moment Correlation on the relationship between scribbling and preschoolers' acquisition of literacy skills

		Scribbling	Preschoolers' Acquisition of Literacy Skills
Scribbling	Pearson Correlation	1	.509**
	Sig. (2-tailed)		.000
	N	877	877
Preschoolers' Acquisition of Literacy Skills	Pearson Correlation	.509**	1
	Sig. (2-tailed)	.000	
	N	877	877

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows that the p-value of Pearson's Product Moment Correlation between scribbling and preschoolers' acquisition of literacy skills as .000 which is less than 0.05. Therefore, the null hypothesis three is rejected and therefore stated thus: there is a significant relationship between scribbling and preschoolers' acquisition of literacy skills in public Early Childhood Centres in Eleme Local Government Area.

Summary of Findings

The following are the findings of this study:

1. There is positive and significant relationship between painting and preschoolers' acquisition of literacy skills in public early childhood education centres in Eleme Local Government Area.
2. There is significant and positive relationship between scribbling and preschoolers' acquisition of literacy skills in public early childhood education centres in Eleme Local Government Area.

Discussion of Findings:

The findings in table 1, shows a significant and positive relationship between painting and preschoolers' acquisition of literacy skills in public early childhood education centres in Eleme Local government Area. The issue of painting in early childhood centres cannot be ruled out

from preschoolers' daily activities. Apart from the vibe and fun preschoolers derived from painting, painting also help them develop their fine motor skills which use very important in writing and holding of paint brushes, pencils and crayon. This finding could be due to the fact that preschoolers are always carrying out painting activities. When they paint, they could also paint and appreciate letters they have just painted. Hence, painting exposes them to literacy activities such as letter identification and print awareness among others. This study agrees with the findings of Brian (2020), who noted that fine motor activities, such as painting, directly influence a child's ability to develop writing fluency, an essential component of early literacy development. Painting helps preschoolers develop fine motor control, which is essential for writing. Using brushes, fingers, or other tools to paint helps preschoolers refine the motor skills needed to hold a pencil and form letters. Research by Rowe (2018) shows that activities like painting enhance fine motor development, which is closely linked to the ability to write legibly and form letters correctly, a crucial aspect of literacy.

The finding in table 2 indicated a strong, positive and significant relationship between scribbling and preschoolers' acquisition of literacy skills. The issue of scribbling is one of the early expressions carried out by preschoolers in school. Preschoolers show case their creativity from scribbling exercises. As preschoolers scribble, they try to write mock letters and other literacy skills. This study is in agreement with the findings of Nueman (2020) who showed that the art-based activities such as scribbling promote oral language development, which is critical in building literacy foundations. Also Puranik and Lonigan (2017) asserted that scribbling is a critical stage in early literacy because it helps preschoolers develop the muscle strength and dexterity needed for forming recognizable letters. In their contribution, Joshua and Okogba (2024) maintained that scribbling is a pre-writing activity that upon which other literacy skills of preschoolers are hinged.

Conclusion

This study focused on relationship between creative expression and preschoolers' acquisition of literacy skills in public early childhood education centres in Eleme Local Government Area. The learning activities that preschoolers are exposed to have gone beyond talk and chalk

approach to hands-on activities. This will integrate the interest and needs of preschoolers into the classroom space for profitable learning experiences. For preschoolers to acquire sound literacy skills, certain activities are needed to boost the skills' acquisition. One of such is creative expression, which has to do with the activities preschoolers carry out with their hands in the classroom; such include painting and scribbling. From the findings so far, it could be concluded that there is a significant relationship between creative expression such as, painting and scribbling and preschoolers' acquisition of literacy skills.

Recommendations

The following recommendations were made based on the findings of the study:

1. Head teachers should provide preschoolers with appropriate learning materials to use in painting exercises in order to enable them acquire the necessary literacy skills.
2. Caregivers should ensure that preschoolers do not lack materials, rough papers needed to scribble in order to acquire proper writing skills.

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PERCEPTION OF TEACHERS ON THE IMPACT OF QUALITY LEARNING ENVIRONMENT ON ACADEMIC PERFORMANCE OF PUPILS IN AWKA SOUTH LOCAL GOVERNMENT EDUCATION ZONE

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Abstract

The study investigated the perception of teachers on the impact of quality learning environment on academic performance of Awka South L.G.A of Anambra State. The study was guided with three (3) research questions and three (3) hypotheses. The research adopted the descriptive survey design. The population for the study comprised of 627 public primary school teachers (265 male and 362 female teachers) in Awka South L.G.A. 109 teachers (35 male 74 female) primary five teachers were randomly selected through Simple random sampling and purposive sampling. A Questionnaire titled "Impact of Quality Learning Environment on Academic Performance of Pupils Questionnaire" was used as instrument for data collection. The instrument was validated by three education experts. Reliability of the instrument was determined with Cronbach alpha. The reliability test yielded reliability coefficients of 0.89, 0.83 and 0.90 were obtained for each of the clusters respectively with an over-all co-efficient value of 0.87. Mean and standard deviation were used as data analysis instrument while t-test was used to test the hypothesis at .05 level of significance. Findings revealed that primary school teachers perceive that the nature of the physical infrastructure such as the classroom dilapidated buildings, lack of computer laboratory and nature of the school playground had impacts on pupils academic performances. It also reveal that quality social learning environment such as cordial relationship among teachers, cordial relationship between teachers & instructional materials and socialization of pupils through play has meaningful impacts of pupils academic performances. There is a significant mean difference in the perception of male and female teachers on impact of quality physical learning environment on academic performance of primary five pupils. However, there was not significance difference in the perception of male and female teachers on quality social learning and quality temporal learning environment on pupils academic performances. The study recommends among others that entire head teachers should pay more attention in renovations of dilapidated physical

infrastructures and procurement of instructional materials in schools to maximize pupil's activeness to lessons which should contribute to their academic performances.

***Keywords**: Primary school, teacher, quality learning environment, academic performance*

Introduction

Education is perceived as the vehicle that drove the ancient world into the digital society we experience today. It is also responsible for the training of citizens in different careers that would benefit them, their families and society at large. Iwuanyanwu and Uwadiegwu (2019) posited that education is a developmental process initiated by an individual which collectively influences societal values. In the views of Ofojebe and Kene-Chiedu (2020) education is perceived as the corner stone of economic and social development and a principal means of providing for the welfare of individuals. Education is what happens to an individual from birth till death. This means that a child's education begins once he is born. This education begins informally at home and continues formally in the primary school.

Primary school is an educational institution where children receive primary education prior to their entry into secondary school. According to the National Policy on Education as cited in Hayab and Ogunode (2021), primary school is an academic institution where children aged six to eleven (6-11) are provided with basic literacy and numeracy skills. Unicef (2024) asserted that in primary schools, children learn foundational skills that prepare them for life, work and active citizenship. This means that primary school is an inclusive and formal academic institution which provides learning contents to pupils within the particular age limit of five through eleven. The primary school as an educational institution cannot be effective without the activities of a teacher.

A teacher is a trained and certified individual whose job is to teach in schools. He is also a professional in education whose activities is to educate and guide a child on academic issues. Aleke (2016) defined a teacher as one who is professionally trained to impart knowledge, attitudes and skills to a learner. Similarly, Okeleke (2023) defines a teacher as a person with the responsibility of training and educating members of any given society towards the acquisition of desired: knowledge, values, ideologies and skills for the benefit of the society. Okeleke averred that a teacher is expected to possess requisite qualification and qualities relevant to execute teaching practice effectively, so as to instil in the products the desired

knowledge and skills. This definition suggests that a teacher is occupied with many responsibilities bothering himself and students under his watch. Oluwatayo, Ugwude and Aguocha (2020), noted that teachers are generally responsible for maintaining and developing subject knowledge and understanding, reflecting on their own practice, taking active responsibility for their own continuing professional development and participating in the school's procedures for performance management. A teacher is also ultimately responsible for translating educational policies and principles into actions based on practice during interaction with the pupils. A professional teacher would desire to carry out his teaching activities in a quality learning environment.

Learning environment simply means a space provided in the school that befits learning. William (2015) referred to learning environment as the diverse physical locations, contexts, and cultures in which students learn. Relatively, Rusticus, Worthington, Wilson and Joughin (2020) defines learning environment as that which comprise the psychological, social, cultural and physical setting in which learning occurs and in which experiences and expectations are co-created among its participants. Based on the above submissions, quality learning environment is that particular environment specially prepared for learning. A group Alliance for Education Solutions (2024) defined quality learning environment as that which encompasses both the school culture and school climate and characterized with physical and psychological safety; high levels of trust and collaboration; solid understanding of the effects of poverty; positive school, family, home and community relationships; needs-based approaches for all pupils; engaging and relevant curriculum; pupils voice and engagement; effective transition; attention to children attendance and mobility; and appropriate behavioural interventions. A good learning environment is a compendium of all physical infrastructures, instructional materials, and the relationship in the school.

The physical infrastructures as an aspect of the learning environment, comprises of all the buildings made available for learning. Odeh, Oguche and Ivagher (2015) outlined the characteristics of the school infrastructures to include school buildings, furniture's, playgrounds, sporting facilities and other related equipment which aid the teacher's delivery of lesson. Elujekwute (2019) refers to infrastructures as all the physical buildings available for learning in the school environment. It therefore means that infrastructures that make up the school learning environment include the laboratory, library, classrooms, staffroom and other

important physical structures that promote learning. These infrastructures suits meaningfully in learning when they are equipped with desired instructional materials.

The instructional materials that contributes to the learning environment includes all educational materials that are used by teachers to draw their lessons closer to children's level of understanding. Oke (2016) defined instructional material as tangible or physical object which provides rigorous, visual or both to the five senses during teaching and learning. Oke further said that instructional materials are all forms of information carriers that can be used to stimulate and boost effective teaching and learning accomplishments. Similarly, Ogoda, Akume, Edo, and Ogi (2019) posited that instructional materials are those alternative channels of communication, which a classroom teacher can use to concretize a concept during teaching and learning process. Anything that stimulates a learner during learning and results in the understanding of the curricula content may be classified as instructional materials. However, the use of appropriate school infrastructures and instructional materials may not be successful without the desired relationship in the classroom.

The social relationship in the school contributes significantly to student learning as well as their academic performances. Bright in Chinonyerem (2016) observed that teacher-pupil social relationship has a great influence on the school subjects taught by the teachers which reflects on the academic performance of children. The authors study at the University of Maryland College Park showed that learners who have cordial social relationship with their lecturers found the courses those lecturers taught easy and interesting and thus performed academically better, unlike the other courses they took. Akoja (2017) held that nature of teacher-pupil relationship has an effect on pupils' academic performance in the subject area the teacher is teaching and that there is a tendency for immorality and lousiness on both side if the relationship becomes too informal. Hence, Suleiman and Otieno, (2022) assert that the relationship between teachers, learners and instructional materials are significant in the quest for quality education. On the whole, the learning environments as discussed in paragraphs above, can effectively contribute to children's academic performances.

Academic performance is described as how well a child performed in a particular academic endeavor. Abaidoo (2018) posit that academic performances are those measurable results of a child culled from learning activities and exercises, test, defense, practical, assignments and examinations. According to Amaechina and Ezeh (2019) academic performance refers to how

well a learner accomplished his or her tasks and studies. The authors averred that academic performance is ability of a learner to obtain high grades and standard test scores in school courses, especially courses that are part of the core academic curriculum. Academic performance also deals with the way children go about their studies and responsibilities given to them by their teachers. This corroborates with Ajayi and Abaidoo (2022) who submitted that academic performance is the competency of learners to complete various assignment allocated to them by their teachers. Academic performances of school children are important because it periodically evaluates efforts made by pupils towards learning. It also serves as a mirror to access the school environment to know if its equal to children's motivation and determines learning. Academic performances of pupils is sometimes determined by gender.

Gender refers to the socio-cultural, personal, and physical features of being a male or female. It is a spectrum that is identified and expressed in diverse ways. Onye and Obizue (2020) averred that gender connotes all the roles, behaviours, and traits that society deems appropriate and expects of male and female individuals. Ubabudu (2024) reported that in recent times, educational stakeholders have expressed great concern about the poor academic performance of learners, and the academic gap which is sometimes attributed to gender disparity. However, there has been debates over gender and academic performances. For instance, a research study conducted by Orji, Phoebe, Ogbonnaya, Nkpoyen and Edet (2921) showed that gender has no appreciable effect on the academic performance among learners. But other scholars and their findings show the contrary. Conversely, research by Asif, Safdar, & Ali (2020), Kisigot, Ogula, and Munyua (2020), Siddiky and Haque (2024), revealed that gender or sex had an impact on learners' academic performances.

It has been observed through the pages of different literatures that some authorities had aired their views on what should be the impact of quality learning environment with particular reference to academic performance of pupils taking cognizance of the physical, social and temporal learning environment. For instance, Hurst, Wallace and Nixon (2013) reported that social interactions helps the teacher in effective teaching and improve learning by enhancing children's knowledge of literacy, critical thinking and problem-solving skills. This is in-line with Lukman (2023) who reported that a positive social learning environment contributes to learners behavior in class which also positively tells on their performances in school. Green-Taylor (2024) posited that the temporal learning environment creates sense of security, help young children to learn about their world, adjust to new situations and prevent challenging

behaviours. The author further narrated that the temporal learning environment which comprises of the daily routes in the school also helps young children to feel safe within a nurturing network of caregivers. Ikegbusi, Eziamaka and Iheanacho (2021) held that there is a serious influence of school physical structure on pupils learning and interest in schooling. The physical learning structure here according to Ikegbusi et al comprise of the aesthetic design of the school buildings, spaced and well arranged classroom, indoor and outdoor facilities and a host of others. Contributing, Ihekoronye (2020) observed that a conducive and healthy school environment shapes the attitudes which children develop toward the school as well as promotes teaching and learning; while Okenyi (2022) pointed out that the use of instructional materials in teaching makes classroom activities practical, real, motivating and attractive for both teachers and pupils. Akurut (2023) also reported that instructional materials such as animations, study guides and tours, website archives' among others contributed meaningfully towards children's academic performances. This in effect translates to enhance pupils' academic achievements, as it results to active and effective participation in the classroom for both learners and instructors.

A mere observation at some public primary schools in Awka South LGA indicates that there are classrooms provided for learning. These classrooms are full of desk and chairs though some are broken. Some walls of these classrooms are painted while others are not. A good number of them had pictures of objects, fruits and animals on them. There is also an observed conventional class routines activities such as time for devotions, time for lessons, time for break, and time for dismissal. A critical observation also shows that pupils relates with each other in play and classroom activities such as drawing and question/answer series. These observations where on ground in some schools. However, the perceptions of teachers on the impacts of these learning environments is yet to be ascertained and this becomes a major gap in this study. Also, in different literatures consulted, none were found to be conducted in the study area among the literatures; there is also absent of teachers perceptions on the impact of learning environments on pupils academic performances and this is another gap created in this study. There is also dearth of opinions of male and female teachers concerning their perceptions on the impact of quality physical, social and temporal learning environment. These observed gaps are what this study sought to fill.

Research Questions

The following research questions guided this study

1. What are the perceptions of teachers on the impact of quality physical learning environment on pupils academic performance in Awka South L.G.E.A of Anambra State?
2. What are the perceptions of teachers on the impact of quality social learning environment on pupils academic performance in Awka South L.G.E.A of Anambra State?
3. What are the perceptions of teachers on the impact of quality temporal learning environment on pupils academic performance in Awka South L.G.E.A of Anambra State?

Research Hypothesis

1. There is no significant difference in the mean perception of male and female teachers on the impact of quality physical learning environment on pupils academic performance Awka South L.G.E.A
2. There is no significant difference in the mean perception of male and female teachers on the impact of quality social learning environment on pupils academic performance in Awka South L.G.E.A
3. There is no significant difference on the mean perception of male and female teachers on the impact of quality temporal learning environment on pupils academic performance in Awka South L.G.E.A

Methods

The study adopted a descriptive survey research design. It was guided by three research questions ad tree hypothesis. The population for the study comprised of 627 public primary school teachers (265 male and 362 female teachers) in Awka south L.G.E.A. 109 teachers were e sample size for the study. Simple random sampling and purposive sampling was used to select 35 male teachers and 74 female teachers in the public Primary schools. The instruments for data collected consisted of 18 items used to elicit relevant information based on the problem investigated. The data for the study was gathered with a questionnaire titled "Impact of Quality Learning Environment on Pupils Academic Performance Questionnaire. The instrument was

validated and yielded reliability co-efficient of 0.83, 0.86 and 0.87 with a general index of 0.86. A criterion mean of 2.50 was also established to analyze the questionnaire, thus, responses with mean of 2.50 and above were agreed while those below 2.50 were disagreed. The t-test statistics was used to test the hypotheses at 0.05 level of significance. The decision rule is that if P-value is less than level of significance, reject Ho.

Results:

Research Question 1: What are the perceptions of teachers on the impact of quality physical learning environment on pupil's academic performance in Awka South L.G.E.A of Anambra State?

Table 1

Mean Ratings on Perceptions of Teachers on the Impact of Quality Physical Learning Environment on Academic Performance of Primary Five Pupils

S/N		Gender	N	Mean	SD	Decision
1	The nature of the classroom play a major role in children's success in learning	Male	35	2.81	0.46	Agree
		Female	74	2.72	1.42	Agree
2	Dilapidated buildings in the school demoralize children's active participation to learning and this affects their performance	Male	35	2.78	1.83	Agree
		Female	74	2.92	1.61	Agree
3	Closeness of classrooms makes classrooms noisy and affects learning	Male	35	2.01	0.23	Disagree
		Female	74	2.40	0.88	Disagree
4	None-availability and use of quality library as perceived by teachers contributes to poor learning among pupils	Male	35	2.19	1.26	Disagree
		Female	74	2.33	1.42	Disagree
5	Inadequate quality edifice for computer laboratory contributes to poor learning and performance in computer studies	Male	35	3.01	1.49	Agree
		Female	74	2.77	0.98	Agree
6	The aesthetic nature of the school environment contributes to academic success of pupils	Male	35	1.96	0.54	Disagree
		Female	74	2.24	0.12	Disagree
7	The nature of the school playground determines children's success in physical education	Male	35	2.90	0.56	Agree
		Female	74	2.69	1.09	Agree
	Grand Mean	**Male**		**2.52**	**0.91**	
		Female		**2.58**	**1.07**	Agreed

The findings in Table 1 shows the mean ratings on perceptions of primary school teachers on the impact of quality physical learning environment on academic performance of primary five pupils. It shows that primary school teachers perceive that the nature of the classroom, dilapidated buildings, lack of computer laboratory, and nature of the school playground are physical factors that impacts on pupils academic performance.

Research Question 2: What are the perceptions of teachers on the impact of quality social learning environment on pupil's academic performance in Awka South L.G.E.A of Anambra State?

Table 2

Mean Ratings on Perceptions of Teachers on the Impact of Quality Social Learning Environment on Academic Performance of Primary Five Pupils

S/N		Gender	N	Mean	SD	Decision
8	Cordial relationship among teachers has a positive impact of pupils academic performances	Male	35	2.56	0.72	Agree
		Female	74	2.81	0.42	Agree
9	Poor relationship among pupils in school contributes to their poor academic performances	Male	35	2.69	0.84	Agree
		Female	74	2.60	1.27	Agree
10	Positive relationship among teachers with instructional materials makes pupils active to lessons	Male	35	2.77	1.22	Agree
		Female	74	2.93	0.45	Agree
11	Academic performance of pupils is commendable when pupils socialize meaningfully with play materials	Male	35	2.82	0.92	Agree
		Female	74	2.64	1.33	Agree
12	Pupils tend to perform academically better when their relationship with teachers becomes informal	Male	35	1.62	1.67	Disagree
		Female	74	2.30	1.23	Disagree
	Grand Mean	**Male**		**2.51**	**1.07**	
		Female		**2.65**	**0.94**	Agreed

The findings in Table 2 shows the mean ratings on perceptions of primary school teachers on the impact of quality social learning environment on academic performance of primary five pupils. It shows that primary school teachers perceive that cordial relationship among teachers, positive relationship among teachers with instructional materials and relationship among pupils

with play materials impacts academic performances meaningfully. It also shows that poor relationship among pupils and informal relationship with pupils and teachers leads to poor academic performances.

Research Question 3: What are the perceptions of teachers on the impact of quality temporal learning environment on pupil's academic performance in Awka South L.G.E.A of Anambra State?

Table 3

Mean Ratings on Perceptions of Teachers on the Impact of Quality Temporal Learning Environment on Academic Performance of Primary five Pupils

S/N		Gender	N	Mean	SD	Decision
13	Children who spend much time in play outperform others in school	Male	35	0.29	1.64	Disagree
		Female	74	0.72	1.39	Disagree
14	Children who spend normal time in lunch and rush back to lessons outperform others who spend much time	Male	35	2.98	1.24	Agree
		Female	74	3.02	0.52	Agree
15	Much time spend on group activities encroaches into other assessments and this affects other performances	Male		2.76	0.45	Agree
		Female		2.88	0.22	Agree
16	Children who arrive class late miss lessons but this does not have negative impact on their performances	Male	35	1.29	1.09	Disagree
		Female	74	0.82	1.88	Disagree
17	Much time spent on rest negatively impacts on pupils performances	Male	35	1.17	1.74	Disagree
		Female	74	2.34	1.20	Disagree
18	There is high performance of pupils who spend less time in reading rather than attending to lessons	Male	35	2.12	1.34	Disagree
		Female	74	1.95	1.12	Disagree
	Grand Mean	**Male**		**1.43**	**1.25**	
		Female		**1.95**	**1.05**	**Disagreed**

The findings in Table 3 shows the mean ratings on perceptions of primary school teachers on the impact of quality temporal learning environment on academic performance of primary five

pupils. It shows that primary school teachers perceive that children who spend normal time in lunch and rush back to lessons outperform others who spend much time and that much time spends on group activities encroaches into other assessments and this affects other performances. Children who overplay and arrive to school late were victim of poor performances.

Hypothesis 1

There is no significant difference in the mean perception of male and female teachers on the impact of quality physical learning environment on pupils academic performance Awka South L.G.E.A

Table 4

t-test comparison of mean ratings in perception of male and female educators on the impact of quality physical learning environment on academic performance of primary five pupils

Gender	N	Mean	SD	df	t	P-value	Decision
Male	35	2.52	0.91				
				107	1.984	0.352	Significant
Female	74	2.58	1.07				

Table 4 indicates that there is a significant mean difference in the perception of teachers on impact of quality physical learning environment on academic performance of primary five pupils. The null hypothesis in this regard is therefore rejected since the p-value (0.352) is less than the level of significant (.05).

Hypothesis 2

There is no significant difference in the mean perception of male and female teachers on the impact of quality social learning environment on pupils academic performance in Awka South L.G.E.A

Table 5

t-test comparison of mean ratings in perception of male and female teachers on the impact of quality social learning environment on academic performance of primary five pupils

Gender	N	Mean	SD	df	t	P-value	Decision
Male	35	2.51	0.07				Not
				107	1.984	0.909	Significant
Female	74	2.65	0.94				

Table 5 indicates that there is no significant mean difference in the perception of perception of male and female teachers on the impact of quality social learning environment on academic performance of primary five pupils. The null hypothesis in this regard is therefore not rejected since the p-value (0.909) is greater than the level of significant (.05)

Hypothesis 3

There is no significant difference on the mean perception of male and female teachers on the impact of quality temporal learning environment on pupils academic performance in Awka South L.G.E.A

Table 6

t-test comparison of mean ratings in perception of male and female teachers on the impact of quality temporal learning environment on academic performance of primary five pupils

Gender	N	Mean	SD	df	t	P-value	Decision
Male	35	1.43	1.25				Not
				107	1.984	1.238	Significant
Female	74	1.95	1.05				

Table 6 indicates that there is a significant mean difference in the perception of male and female teachers on the impact of quality temporal learning environment on academic performance of primary five pupils. The null hypothesis in this regard is therefore not rejected since the p-value (1.238) is greater than the level of significant (.05)

Discussion

Findings show that the nature of the classroom, dilapidated buildings, lack of quality computer laboratory and nature of the school playground as perceived by teachers constitute a problem towards quality physical learning environment whereas closeness of classrooms, non-use of library and aesthetic nature of the school environment do not. The above findings corroborates the findings of Nuhu (2015) reported that the classroom building with adequate furniture; class with small class population and the use of instructional materials were found to have positive impact on the performance of students. Ikegbusi, Eziamaka and Iheanacho (2021) also identified physical facilities such as nature of indoor & outdoor facilities, spaced classroom, and the beautiful nature of the school buildings on as compliments to learning interest and academic performances. The hypothesis test indicated that there was a significant difference between perception of male and female teachers on impact of quality physical environment on pupils academic performance.

Finding also show that teachers perceive that their cordial relationship, relationship among pupils, positive relationship with the teacher and instructional materials contributed to the impact of quality social environment. The above findings are in-line with Suleiman and Otieno, (2022) reported that cooperation among teachers, learners and instructional materials remains vital towards the quest for quality education. This means that the above findings revolves around cooperation; thus, when there is no cooperation, the effect tells on \learners and their performances. Some of the above findings are also in-line with Ikegbusi, Eziamaka and Iheanacho (2021) who reported that teachers interaction with co-teachers and other staff; their interaction with pupils; and pupils interaction with their fellows were perceived as significant towards academic performance and achievements of learners. The hypothesis tested show that male and female teachers do not differ in their perceptions on the impact of quality physical environment on pupil's academic performance.

Finding show that teachers perceive that the temporal learning environment children find themselves such as normal time for lunch had meaningful impact on their academic performances. However, children who spend much time in play, spends much time in lunch, much time on group activities that encroaches into other lessons, those who came late and those who spend less time in reading were perceived by teachers as having negative impacts on academic performances. The above findings are in-line with Paris, Beeve and Springer (2017)

who reported that an organized classroom is known with its temporal environment which includes the use of schedules and established routines and that they are important because they influences a Child's social and emotional development. Green-Taylor (2024) also identified the school timing, sequence and length of routines and activities that take place throughout the school day as the temporal environment that determines academic performances of learners. This means that the nature of the temporal environment in any school determines if students will perform high or low. The hypothesis tested show that male and female teachers do not differ in their perceptions on the impact of quality temporal learning environment on pupil's academic performance.

Conclusion

Primary school teachers in Awka South perceived that the physical layout of the school, the social environment and the temporal environment has a great impact on pupils academic performance of Awka South L.G.EA. The physical facilities includes the classroom structures, the laboratory, library, the playground to among others. The social relationships includes teacher to teacher, teacher to pupils and finally pupils with their colleagues while the temporal environment includes the daily routine that goes on in the school. All these impacts pupil's academic performances.

Recommendations

Based on the findings in this study, the paper recommends as follows:

1. State government should ensure that physical infrastructures in the school are periodically maintained and where there is need to erect new ones, it should be done urgently so that teachers and pupils can assess them for learning. Rehabilitation and maintenance will enhance the aesthetic of schools, attract pupils to school and thus, contribute to pupils academic performances.

2. Social environment in the school should be strengthened through teachers efforts to ensure that children feel free to associate with their teachers and peers at all times for the purpose of academics.

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MOTHER TONGUE MEDIUM OF INSTRUCTION AS CORRELATE OF PUPILS ACADEMIC ACHIEVEMENT IN BASIC SCIENCE IN AWKA SOUTH LOCAL GOVERNMENT EDUCATION AUTHORITY

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Abstract

This study explored mother tongue medium of instruction as correlate of pupil's academic achievement in basic science in Awka South Local Government Education Authority of Anambra State. Two purpose of the study, two research questions and two null hypotheses tested at 0.05 level of significance guided the study. Correlational research design was adopted for the study. The population consisted of 665 public primary school teachers in the 45 public primary schools in the area. Using simple random sampling technique of balloting without replacement, 200 teachers were selected as the sample for the study. Mother Tongue Medium of Instruction as a Correlate of Pupils Academic Achievement in Basic Science in Primary Schools (MTMICPAABSPS) Questionnaire was used to collect data on pupils' use of mother tongue in basic science, while data for academic achievement was collected from the annual result record sheets (pupils' annual cumulative result of 2022/2023 academic session) in each of the sampled schools. Face and content validity of the instrument was determined by three experts; one in the Department of Early Childhood and Primary Education and one in Measurement and Evaluation in the Department of Educational Foundations both from the Faculty of Education, Nnamdi Azikiwe University, Awka and a Basic Science classroom teacher in Awka South. Cronbach Alpha was employed for the reliability of the instrument and reliability coefficient of 0.81 was obtained. Data collected with the aid of three research assistants who were basic science classroom teachers were analysed using Pearson Product Moment Correlation Coefficient for the research questions while the hypotheses were tested also using significance of the correlation at 0.05 alpha level. Findings of the study revealed among others that there is a high positive relationship between

mother tongue and pupils' academic achievement in basic science in primary schools. there is no significant relationship between male and female pupils' use of mother tongue and their academic achievement in basic science in primary schools in Awka South Local Government Education Authority. It was concluded that the use of mother tongue as a medium of instruction has the potential to improve understanding and knowledge impartation in the classroom, and, by extension, improve academic achievement since mother tongue is the language with which the pupils use to create their own knowledge. The study recommended that Federal government should further re-enforce the use of mother tongue as recommended in National policy of Education as a medium of instruction at the lower level of basic education for effective and efficient teaching and learning to take place among others.

Keywords: *Language, Mother Tongue, Basic Science and Academic Achievement*

Introduction

The importance of language in any human society cannot be over emphasized as it is of utmost importance in our day to day interaction which has ensured orderliness in the society. Language is the primary vehicle through which human culture is acquired, shared and transmitted. Language is a treasure of culture and self-identity. Without language, there is bound to be problem in the society for thoughts, ideas, information, and the society would become impossible. According to Yusuf, Bello and Obafemi (2016), language is seen as a set of arbitrary vocal symbols shared by a group of people who are connected by mutual and natural trust. Language is a distinctively human system of communication based on oral and written symbols. In the same vein, Obanya as cited in Udensi, Ogbonnaya and Ezema, (2018), opined that language is man's most important gift and maintained that language is a good instrument for thought and creativity. Language is culture bound and is transmitted from generation to generation. History and culture have an overbearing influence on the language of a particular group of people. In the case of Nigeria, there are two sets of languages on which communication revolves: the native languages or the mother tongue with its numerous and distinct dialects and the English Language. Nigeria has an estimate of four hundred and fifty languages which are mutually unintelligible to each other, with Igbo, Hausa, and

Yoruba as the three major languages and other languages such as: Tiv, Igala, Efik, Ebira, Jukun, Ijaw, among others as the minor languages. The socialization of a child into culture or society involves the use of indigenous language, which he describes as the life blood of any culture (Udensi, Ogbonnaya and Ezema, 2018).

First language (also known as native language/father tongue/mother tongue, arterial language, or L1) is a language that a person has been exposed to from birth. Sometimes, the term "mother tongue" or "mother language" is used for the language that a person learned as a child at home (usually from their parents). Mother-tongue is the language that a child learns in his/his mother's lap. It is the language which the child learns almost without any conscious effort on his part. It is a language which the child acquires while living in his own social group. According to Solanke as cited in Yusuf, Bello and Obafemi (2016), mother tongue is an indispensable cultural legacy with which all forms of human interaction are carried out. Abijo (2014) opined that "mother tongue education is the use of the native language or the first language to teach at formal and non-formal levels". Mackenzie and Walker (2013) corroborate Abijo's view and state that children's potentials are often wasted when language acquisition is attempted without the use of native language which results in lack of development and educational failure. Fafunwa as cited in Ozoemena, Ngwoke and Nwokolo (2021) opined that mother tongue education is the systematic way of training and instructing a child through the medium of first language. The authors further states that mother tongue involves a formal approach which is the use of first language in teaching a child, or the use of mother tongue or native language as a means of formal education in schools. National Policy on Education (FRN, 2013), stipulated that the medium of instruction for pupils in schools especially at the pre-primary and lower basic education should be done with the use of mother tongue. The mother tongue should be used to teach pupils all the subjects especially basic science. The fact that, science education is an indispensable tool for national development made the Nigerian government to provide two stand-alone science inclined subjects, which are basic science and basic technology in order to enable primary schools pupils' acquire basic scientific literacy at their tender age.

In practical terms, basic science is actually an integration of sciences. Basic science is body of knowledge that prepares Basic education pupils for the study of core science subjects (physics,

chemistry, biology) at the senior secondary school level. This implies that for a student to be able to successfully study single science subjects at the senior secondary school level and tertiary institutions, such student had to be well grounded in basic science at the Basic education. In a nutshell, Yaga (2014) posited that, basic science involves helping children develop basic scientific ideas and understanding, which will enable them to explore and investigate their world.

At the completion of the compulsory 9-year basic education level, pupils are expected to have developed interest for advanced studies in the field of science and technology. Onwu in Ugwu (2014) asserted that, basic science prepares pupils to observe and explore the environment to explain simple natural phenomena and to develop scientific attitudes such as curiosity, critical reflection and objectivity. In addition, basic science enable pupils to apply the acquired basic scientific skills and knowledge to solve everyday problems in the environment, develop self-confidence and self-reliance through problem solving activities in science endeavors. In order to ascertain the academic progress of pupils in basic science, they are subjected to termly assessment exercises to determine their level of academic achievement in the subject.

Academic achievement is commonly measured by examinations or continuous assessment. Academic achievement is the outcome of education, it is the extent to which pupil, teacher or institution has achieved their educational goals (Oyetade, 2014). In the same vein, Karue and Amukowa (2013) viewed academic achievement as the level of individuals' education and/or educational outcomes accomplished successfully, as a result of learning at school. Academic achievement distinguishes inactive pupils from serious pupils. Moreso, Kosgei, Mise, Odhiambo and Ayugi (2013) asserted that, in order to quantify the academic achievement of students, grade point average, semester grade point average and cumulative grade point average (CGPA) are used. Adeyemo (2011) opined that academic achievement means achievement a student makes in school namely; his marks in the examination, which is the criterion for the achievement of pupils.

Despite the importance attached to science education, it appears that the purpose of teaching of science education have not been fully achieved as there has been an observably systematic failure in pupil's academic achievement in basic science in public primary schools in Anambra State. Document cited by the researcher from the office of the Local Government Education Authority, Anambra State showed that primary school pupils' results in the 2018/2019, 2019/2020,

2020/2021 and 2021/2022 academic sessions in Basic Science Common Entrance Examination published by Anambra Ministry of Education, only 40.23%, 37.18%, 32.19% and 47.14% respectively of pupils were able to make credit passes and above (Anambra State Universal Basic Education Board, 2023). This revelation points to the fact that academic achievement of pupils in the subject in Anambra State is not encouraging. Alarmed by this development, Otarigbo and Oruese as cited in Agaba and Ogwuche (2020) reported that lack of specialist teachers in basic science are currently employed in primary schools and also non use of mother tongue as a medium of instruction in teaching pupils science concepts. This situation has been a serious concern to all stakeholders in the education sector, probing into the root causes of pupils' poor performances in basic science. With differing opinions; some attributing it to the difficult nature of the subject, others have attributed it to poor and inadequate teaching and learning facilities and inadequate laboratories, while a vast majority have attributed it to the teachers handling the subject (Ayibatonye and Ikechi, 2018). Without an iota of doubt, the use of mother tongue will help pupils break new grounds in the course of studying basic science. The issue of gender disparity in the context of academic achievement is a common phenomenon in Nigeria.

The issue of gender is an important one in science education especially with increasing emphasis on ways of boosting manpower for technological development. According to Okeke (2018), gender refers to the socially culturally constructed characteristics and roles which are ascribed to males and females in any society. Sunday, Oduwole and Olaoye, (2021) opined that gender differences in the use of mother tongue, seems to be characterized by contradictory results. Also, Onyeka, Nwamaradi and Chimuanya (2023) posited that there is no difference in the level of understanding among male and female students. Beka (2016) pointed out that sex of learners did not reveal statistically significant difference towards the use mother tongue as a medium of instruction. From literature gathered, there are some research works on the perception of pupils on the use of mother tongue. However, in South East, Nigeria, precisely in Awka South Local Government Education Authority, there seems to be paucity of empirical studies concerning the relationship between the use of mother tongue and academic achievement among primary school pupils' in basic science. It is against this backdrop, that the researcher is motivated to ascertain mother tongue medium of instruction as correlate of pupil's academic achievement in basic science in Awka South Local Government Education Authority.

Statement of the Problem

Science education plays an importance role in the technological development and globalization of a nation's economy. This may be the reason why emphasis is placed on the provision of science education at all levels of education in Nigeria. For science education to gain much ground, it must be taught in an organized and well-structured pattern, involving practical activities for both teachers and pupils. This will undoubtedly make learning more interesting and meaningful. However, most of today's science teaching is based on memorization and regurgitation of scientific knowledge. If the Nigerian child is to be encouraged from the start to develop curiosity, initiative, industry, manipulative ability, spontaneous flexibility, manual dexterity, mechanical comprehension and the co-ordination of hand and eye, he should acquire these skills and attitudes through his mother-tongue.

Many learners struggle with comprehension when English is their second language. This difficulty arises due to limited vocabulary, unfamiliar sentence structures, and differences between English and their native language. As a result, they may struggle to grasp the full meaning of texts, instructions, or spoken communication. However, the mother tongue plays a crucial role in enhancing comprehension. When learners have a strong foundation in their first language, they can transfer knowledge, concepts, and critical thinking skills to English. For example, if they understand a topic well in their native language, it becomes easier to learn the same topic in English. Additionally, translating complex ideas into their mother tongue can aid in deeper understanding before expressing them in English.

The problem of poor academic achievement by pupil-s in basic science has been of concern to all science educators in the state. At the school certificate level, the Common Entrance Examination (2023) confirms this observation. Several factors contributed to deterioration in Pupils' academic achievement in basic science which includes language of instruction used at the early stages of pupils' education, pupils' interest and their inability to retain the concepts learnt among others. It is possible that these factors jointly or singly affect pupils` academic achievement in basic science. It is also possible that language of instruction in teaching basic science contributes to pupils' abysmal academic achievement in the subject. It is in line with this that, the researchers

investigated mother tongue medium of instruction as correlate of pupil's academic achievement in basic science in Awka South Local Government Education Authority.

Purpose of the Study

The main purpose of the study is to determine mother tongue medium of instruction as correlates of pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority. Specifically, the study sought to determine the:

1. relationship between mother tongue and pupils' academic achievement in basic science in primary schools in Awka South Local Government Education Authority.
2. relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Research Questions

The following research questions guided the study:

1. What is the relationship between mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority?
2. What is the relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

2. There is no significant relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Methods

The study was designed to determine mother tongue medium of instruction as correlate of pupils' academic achievement in basic science in Awka South Local Government Education Authority of Anambra State. Two research questions, two null hypotheses tested at 0.05 level of significance guided the study. The study adopted a correlational research design. The population of the study comprised of 665 public primary school teachers in the 45 public primary schools in Awka South Local Government Education Authority. Using simple random sampling technique of balloting without replacement, 200 teachers were selected as the sample for the study. 10 teachers each were selected from 20 schools out of the 45 public primary schools in the area. Mother Tongue Medium of Instruction as a Correlate of Pupils Academic Achievement in Basic Science (MTMIPAABS) Questionnaire was used to collect data on pupils' mother tongue in basic science, while data for academic achievement was collected from the annual result record sheets (pupils' annual cumulative result of 2022/2023 academic session) in each of the sampled schools. Face and content validity of the instrument was determined by three experts; one in the Department of Early Childhood and Primary Education, one in Measurement and Evaluation in the Department of Educational Foundation both from the Faculty of Education, Nnamdi Azikiwe University, Awka and a Basic Science classroom teacher in Awka South. Cronbach Alpha was employed for the reliability of the instrument and reliability coefficient of 0.81 was obtained. Data collected with the aid of three research assistants who were basic science classroom teachers were analysed using Pearson Product Moment Correlation Coefficient for the research questions while the hypotheses were tested also using Pearson Product Moment Correlation at 0.05 alpha level.

Results

Research Question One: What is the relationship between the use of mother tongue as a medium of instruction and pupils' academic achievement in basic science in primary schools in Awka South Local Government Education Authority?

Table 1: Relationship between Pupils' use of Mother Tongue as a medium of instruction and Academic Achievement in Basic Science

Variables	N	Mother Tongue	Achievement	Decision
Mother Tongue	200	1	0.81	High Positive Correlation
Achievement	200	0.81	1	

Table 1 reveals that the correlation coefficient (r) between mother tongue and pupils academic achievement in basic science is 0.81. This shows that there is a high positive relationship between mother tongue and pupils' academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Research Question Two: What is the relationship between male and female teachers use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority?

Table 2: Relationship between Male and Female Teachers' Use of Mother Tongue as a medium of instruction and Pupils Academic Achievement in Basic Science

Variables (Gender)	N	Mother Tongue	Achievement	Decision
Male	86	0.37	.823	Low Positive Correlation
Female	114	.822	0.37	Low Positive Correlation

Table 2 reveals that the correlation coefficient (r) between the male and female teachers' use of mother tongue and pupils academic achievement in basic science is 0.823 and 0.822 respectively. This shows that there is a low positive relationship between primary school male and female pupils' mother tongue and their academic achievement in basic science.

Hypothesis One: There is no significant relationship between mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Table 3: Test of Significance of Pearson Correlation between the use of Mother Tongue as a medium of instruction and Pupils' Academic Achievement in Basic Science

Sources of Variation	N	R	P-value	Decision
Mother Tongue				
	200	0.81	0.00	Significant
Academic Achievement				

Table 3 shows that the calculated value of r is 0.81 and had P-value (P .00 <0.05). Table 3 also shows that based on the P-value (.00), there is a significant relationship between use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority. Therefore, the null hypothesis was rejected. Therefore, there is a significant relationship between mother tongue and pupils' academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Hypothesis Two: There is no significant relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Table 4: Test of Significance of Pearson Correlation between Male and Female Teachers' use of Mother Tongue as a medium of instruction and Pupils Academic Achievement in Basic Science

Gender	Sources of Variation	N	R	P-value	Decision
Female	Mother Tongue				
	Academic Achievement	114	0.822	0.37	Not Significant
Male	Mother Tongue				
	Academic Achievement	86	0.823	0.37	Not Significant
Total		**200**			

Table 4 shows that the correlation of female teachers' use of mother tongue and pupils academic achievement was 0.822 with P-value of 0.00 while their male counterparts had a correlation of 0.857 with P-value of 0.00. This shows that the null hypothesis was accepted. Therefore, there is no significant relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority.

Discussion of Findings

Findings of the study in table 1 revealed that there is a high positive relationship between mother tongue and pupils' academic achievement in basic science. Also, the findings in table 3 revealed that there is a significant relationship between mother tongue and pupil's academic achievement in basic science in primary schools in the study area. Learning in mother tongue makes pupils to master concepts and skills exposed to them. In general, the use mother tongue as a medium of instruction makes the environment of learning becomes resourceful which in turns influences the academic achievement of pupils in any subject area. This is in accordance with Sunday, Oduwole

and Olaoye (2021) who opined that students performed better when taught in their mother tongue than when taught in English language. Adeosun, Sulaiman, and Sholagberu, (2022) found out that children taught basic science and other subjects using an African language as medium of instruction over a six year period significantly out-performed their peers in all related aspects of the school curriculum. Also, Akumabor as cited in Adeosun, Sulaiman, and Sholagberu (2022) emphasized that for a child to learn basic concepts easily in any subject area like basic science and make significant progress in life and at school, the language to use is the indigenous language which is the child's language of the immediate environment or the mother tongue. This is because indigenous languages are of great importance in the teaching and learning of native intelligence and wisdom which are beneficial to future development in terms of curiosity, manipulative skills, spontaneous flexibility, initiative, and manual dexterity which fosters national pride, and identity.

Moreso, the findings of the study in table 2 revealed there is a low positive relationship between primary school male and female teachers' use of mother tongue and pupils academic achievement in basic science. Also, findings in table 4 revealed that there is no significant relationship between male and female teaches' use of mother tongue and pupils academic achievement in basic science in primary schools in Awka South Local Government Education Authority. This is in accordance with Beka (2016) who pointed out that sex of teachers did not reveal statistically significant difference towards the use of mother tongue as a medium of instruction. Also, Sunday, Oduwole and Olaoye (2021) pointed out that gender has no impact on the learners' ability to learn his or her mother tongue. This could be as a result of equal opportunities and conditions given to the pupils to actively engage and participate in the learning processes. According to Onyeka, Nwamaradi and Chimuanya (2023)**,** they pointed out in their research work that there is no significant difference between the female and male pupils who were taught science in the mother-tongue and that both gender have equal ability to learn concepts in basic science when done using the mother tongue.

Conclusion

If effective and efficient teaching and learning is to be achieved in the primary schools, especially at the lower primary, the use of mother tongue as the medium of instruction ought to be encouraged. From the findings of this study, it can be concluded that the use of mother tongue as a medium of instruction has the potential to improve understanding and knowledge impartation in

the classroom, and, by extension, improve academic achievement since mother tongue is the language with which the pupils think. From the results of this study, it has been empirically proven that using mother tongue in teaching basic science enhances higher mean achievement scores than the use of English language. The study concludes that there is a low positive relationship between primary school male and female teachers' use of mother tongue and pupils academic achievement in basic science. Also, the study concludes that there is a significant relationship between mother tongue and pupils' academic achievement in basic science in primary schools and there is no significant relationship between male and female teachers' use of mother tongue and pupils academic achievement in basic science in primary schools.

Recommendations

Based on the findings of the study, the following recommendations were made;

1. . Federal government should further re-enforce the use of mother tongue as recommended in National policy on Education as a medium of instruction at the lower level of basic education.

2. Curriculum developers should develop basic science curriculum in the mother-tongue for easy planning and presentation of basic science lessons in mother-tongue.

3. Authors and publishers of educational books should endeavour to write and publish basic science books and other instructional materials in the mother-tongue

4. Additional trainings in form of workshops, symposium and seminars should be organized for the in-teachers and pre-service teachers to enhance their level of proficiency in respect to mother tongue and its implementation as a medium of instruction in the classroom.

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THE IMPACT OF TECHNOLOGY ON TEACHING AND LEARNING OF MATHEMATICS IN PRE-PRIMARY SCHOOLS IN ONITSHA SOUTH LOCAL GOVERNMENT AREA, ANAMBRA STATE

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Abstract

This study focused on impact of technology in teaching and learning of Mathematics in pre-primary schools in Onitsha South Local Government Area of Anambra state. Descriptive Survey research design was adopted for the study. It was guided by three research questions. The population comprised of 305 pre- primary school teachers in Onitsha South Local Government Area. The sample comprised of one hundred and five (105) teachers, sixty –six (66) Primary school teachers and thirty – nine (39) Pre – primary school teachers. A 15-item questionnaire was used for collection of data from the teachers. The questionnaire was validated by two lecturers, while spilt half method was used to confirm the reliability of the instrument at coefficient of 0.88. The data were presented in tables and analysed using mean. Results of the study showed that the effective use of technology in teaching and learning of Mathematics in pre-primary schools make children to learn at a faster rate. Similarly, government should train teachers on how to use computer sets and software packages. Recommendations were also made that the government should make efforts to provide technology facilities in pre – primary schools and teachers should be sensitized on the need to use these facilities in mathematics teaching and learning.

Keywords: *Technology, Pre-primary schools, Mathematics, Teaching and Learning*

Background

The word 'technology' is derived from two Greek words: "techne" meaning "art/craft/skill" and "logos" meaning study of something. In view of this etymological understanding, Nwana (2009) pointed out that technology is the systematic study of technique and regular methods of producing things. Technology is the application of scientific knowledge for practical purpose to satisfy perceived needs. The National Policy on Education (FRN, 2013) defined technology under the technical/vocational education as something which involves the study of technologies and related sciences; and the acquisition of practical skills, attitude, understanding and knowledge relating to occupations in various sectors of economic and social life.

The rapid development of technology, in recent years, have brought significant developments in global education systems (Dooley T., Dunphy E., Shiel G., Butler D., Corcoran D., Farrell T., NicMhuira S., O'Connor M., Travers J., & Perry B., 2014). According to the National Council for Educational Mathematics (NCTM, 2015), technology is an integral part of encouraging mathematical skills in kindergarten as well. Toddlers can develop their critical and creative scientific thinking, as well as their interest in Mathematics (Clements &Sarama 2016; Dooley et al. 2014). Technology can support communication, collaboration, critical and creativity scientific thinking and the development of mathematical skills in toddlers. (Calder, 2015; Nikolopoulou, 2014; Papadakis et al., 2018).

Several researchers, have tried to outline some elements or tools of information and communication technology. They include:- a. The computer with its software. b. Communication systems like mobile phones, telephones, telex facsimile, Internet, E-mail, Fax, Videotext, document delivery. c. Technologically oriented audio and audio-visual materials / microwave systems like radio programmes, recorded cassettes, tele-lectures, television programmes, video tapes, and sound motion pictures. d. Reprographic systems (micrographics, electronic copies, word processing). Okoye, (2005); Sanni (2007), and Atagher (2008). Nwachukwu(2003) in his own view outlined other ICT-oriented activities in the field of education to include - Broadcast materials or CD-ROM as sources of information, Micro-computers with projectors and its devices, Electronic toys, E-mail, Video conferencing, Internet-based research and others.

The use of these tools in teaching and learning has several benefits. It creates easy access to information learning opportunities and resources for both learners and teachers, makes learning more flexible, interesting and reduces pupils perception of Mathematics as an abstract subject. It leads to economical delivery of instruction, enables new instructional models, promotes teacher productivity and helps to expand learning time beyond school period (Okoye, 2005 and Sanni, 2007). The use of the internet provides for both teachers and pupils, global access to all kinds of information generation and sharing. Radio and cassette players, educational television, video cassettes and VCD's can be used to teach and reinforce mathematical concepts, skills and processes especially at the primary school level.

According to Trucano (2005), there is widespread belief that technology can and will empower teachers and learners, transforming teaching and learning processes from being highly teacher-dominated to children centred. This transformation results in increased learning gains for children, creating opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills and other higher-order skills. In essence, technology includes tangible products such as machines and devices, as well as intangible innovations like software, methodologies, and systems that facilitate human activities. The impact to which these technology tools are used in pre-primary schools in Onitsha south Local Government Area of Anambra State constitutes a major problem of this study.

Over the years many countries of the world had questioned the value of pre-primary school and what role this early education plays in subsequent academic performance and socialization in the primary grades. Many parents have been on the dilemma of deciding whether or not to send their children to pre-school (Gregory, 2014). The foregoing concern was the basis for the initiative of the convention on the rights of the child, drafted by the United Nations Commission on Human Rights (UNCHR) and adopted by the General Assembly of the UN in 1989. Most countries have turned to universal pre-primary education in order to give children a better start to life (Myers, 2016).There is however some general agreement among experts around the world from developing as well as developed nations that early childhood care and education programs are not only desirable but essential for many children (Sylva, 2019). According to the National Policy on Education (FRN, 2013) Early childhood/Pre-primary is from birth-5 years. Pre-school is the

education given in an educational institution to children prior to their entering into primary school. It includes the crèche, the nursery and the kindergarten.

The objectives of pre-school according to FRN (2004) are:

1. Effect a smooth transition from home to school
2. Prepare the child for the primary level of education
3. Provide adequate care and supervision for the children while their parents are at work (on the farm, in the market or offices)
4. Inculcate social norms
5. Inculcate in the child the spirit of inquiry and creativity through the exploration of nature, the environment, art, music and playing with toys and so on.
6. Develop a sense of cooperation and team spirit
7. Learn good habits, especially good health habits and.
8. Teach the rudiments of numbers, letters, colours, shapes, forms and so on through play.

Teaching can be defined as the axon moving education impulse to deliver growth, development and knowledge. Teaching is an all-purpose profession engaged in human resource development for individual and economic growth. Olatunji (2012) defined teaching as a social function that aims at necessary growth in others. Teaching as an act of guiding and imparting knowledge in and outside the classroom, can only be done professionally by qualified and trained teachers. Teaching task is so challenging that it surpasses holding chalk, standing before children and giving out different kinds of instructions. Teaching as an application of intellectual technique is the only hope that can bring about overall national progress and development to every citizen of Nigeria.

Wells (2012), defines teaching as cluster of activities that are noted about teachers such as explaining, deducing, questioning, motivating, taking attendance, keeping records of work, student progress and students' background information. Morrison (2012), stated that teaching is an intimate contact between a mature personality and a less mature one which is designed to further the education of the latter. Teaching is defined as an interactive process primarily involving classroom talk, which takes place between teachers and pupils and occurs during certain definable activities.

Teaching is defined as an act of transferring the cultural heritage of a society which includes: the knowledge, skills, customs and attitude acquired over the years by teachers to the pupils or students (Evans, 2012). Teaching has to do with instructing or training a person.

Learning is defined as a relatively permanent change in an individual's potential behaviour as a result of experience. It is observed that only observable changes in behaviour seem to justify the inference that learning has occurred. Learning is the process by which an activity originates or is changed through reacting to an encountered situation provided that the characteristics of the change in activity cannot be explained on the basis of native response tendencies, maturation or temporary states of the organism.

Learning is an unending process of interaction between the learner and his environments. It is unending because it starts from birth and continues till death. This life-long process is defined as a process which involves the acquisition of new knowledge, skills, ideas, values and experiences which enable the individual to modify or alter his action or to realize his goals. Learning is acquiring new or modifying existing knowledge, behaviours, skills, values or preference and may involve synthesizing different types of information (Onwuka cited in Onyejekwe,2012).

Opute in Ughamadu and Okoye (2013) opines that no one definition of the concept, learning is universally accepted but there is a general consensus that learning means modification of behaviour as a function of practice. They goes on to say that it takes place when the performance of the organism is changed through stimulating contracts with the environment and that all the basic elements of curriculum are designed around the learner and all these interact to achieve all around development of the learner. Learning can occur in various settings, such as formal education, informal experiences, or self-directed study, and can be facilitated through different methods, including observation, practice, and teaching.

Mathematics has a vital role to play in achieving the highly desired technological / industrial development of the Nigerian society. Its relevance in an individual's daily dealings is so great that acquiring Mathematical skills, ideas, processes, computational abilities, intuitive and deductive reasoning etc, are indispensable tools for a successful and meaningful human existence. According

to Ale, Mathematics has substantial use in all other human activities including school subjects such as technology, science and others.

However, despite the vital role that Mathematics has to play in the society and its relevance in an individual's daily dealings, children's performance in the subject seems to be quite low. Some children exhibit much hatred or dislike for Mathematics. They devote greater time in studying other subjects than Mathematics, despite the compulsory status ascribed to it in the national policy. Several factors have been outlined as contributing to this low achievement of children in Mathematics and they include use of inappropriate teaching methods, and lack of ICT in teaching.

In the present study the researcher tries to record the views of preschool teachers about the usage, the benefits, and the barriers of technology for teaching of mathematics in the Pre-school. Teachers' views are particularly important, because they decide on the use and impact of technology in the teaching and learning of mathematics and as key members, they support the educational process. The main purpose of this study is to examine the impact of technology on the teaching and learning of Mathematics in pre-primary schools in Onitsha South Local Government Area of Anambra state. Specifically, the study sought to:

1. Examine the benefits of technology in teaching and learning of Mathematics in pre-primary schools.
2. Examine the factors affecting the effective use of technology in the teaching and learning of Mathematics in pre-primary schools.
3. Identify possible ways to enhance the effective use of technology in teaching and learning of Mathematics in pre-primary schools.

Research Questions

The following research questions guided the study:

1. What are the benefits of technology in teaching and learning of Mathematics in pre-primary schools?
2. What are the factors affecting the effective use of technology in teaching and learning of Mathematics in pre-primary schools?"

3. What are the possible ways of enhancing the effective use of technology in teaching and learning of Mathematics in pre-primary schools?

Methods

This study adopted a descriptive survey research design. Survey research designs are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people, to describe the attitude, opinions, behaviours or characteristics of the population on a matter being studied(Tanny,2018).The population of the study is made up of all the pre-primary school teachers in Onitsha South Local Government Area of Anambra state. The total number of Primary school teachers in the Local Government Area is 305. Source: Onisha South Local Government Education Authority Fegge Summary Sheet July 2023.The sample of the study therefore was (105) teachers which comprised sixty–six (66) Primary school teachers and thirty – nine (39) Pre – primary school teachers. Primary school teachers were randomly selected from each school (33) two teachers and all the thirty-nine Pre-primary school teachers.

A structured questionnaire titled "Impact of Technology on Teaching and Learning of Mathematics in Pre-Primary Schools Questionnaire (ITLMPSQ)" was used to collect data for the study which was validated as an appropriate instrument for a survey research design. The questionnaire was designed by the researcher based on the objective of the study. There were a total of fifteen (15) items on the instrument. The items on the instrument cover some role of technology in teaching and learning of Mathematics in pre-primary schools. The order of distribution is as follows: items 1-5, covers issues on the benefits of technology and it sought to ascertain whether or not, the schools under study had derived any benefit from the use of technology in teaching or learning. Items 6-10 are on factors affecting the effective use of technology in teaching or learning process and sought to find the degree of effectiveness of technology by the teachers from the pre-primary schools in Onitsha South Local Government Area of Anambra state while items 11-15 are on possible ways of enhancing the effective use of technology in teaching and learning of Mathematic. The respondent were required to respond to the statements on a weighted four-point Likert type of scale of strongly Agree (SA) 4 point, Agree (A) 3 point, Disagree (D) 2 point, and Strongly disagree (SD) 1 point.

To ensure that the instrument for the study asked relevant questions, the researcher made the instrument available for face validated by two experts in the Departments Early Childhood and Primary Education and Measurement and Evaluation. The comments and suggestion made by the experts was used to produce the final copy of the questionnaire. The reliability of the questionnaire was established using split half method. Copies of the instruments were administered to the respondents from the selected pre-primary schools in another LGA and the responses were used to ascertain the reliability of the instrument using Pearson Product Moment Correlation. The instrument had a co-efficient value of 0.88 showing that the questionnaire was reliable for the study. The researcher adopted face to face method of administering the questionnaire. This is to minimize misinterpretation of the questionnaire by the respondents.

A total of 105 questionnaires were administered to the respondents by researchers and all were properly filled. Data was analysed using the mean and standard deviation. Since the generated data would be on interval scale. A criterion mean was set and used in taking decision. The criterion mean was arrived at by summing four, three, two and one and dividing the total by four. Thus: 4+3+2+1/4 = 10/4 = 2.50. Hence, any mean item that is 2.50 and above was accepted but any item mean that is less was considered as negative and was rejected.

Results

This section is concerned with presentation, analysis and interpretation of data of the study. This was done according to research questions.

Research Question 1: What are the benefits of technology in teaching and learning of Mathematic in pre-primary school in Onitsha South LGA?

Table 1: The mean rating of teacher's response on the likely benefits of technology in Primary schools

S/N	ITEMS	SA	A	D	SD	FX	N	X	RK
1	Technology makes children to learn better in maths	42	32	22	15	323	105	3.08	agree
2	Technology helps teachers to teach maths very well	47	27	22	15	328	105	3.12	agree
3	Technology helps children to develop interest in learning maths	44	22	17	12	288	105	2.74	agree
4	Technology would help children access interesting learning materials	45	21	18	11	290	105	2.76	agree
5	Technology help children to understand difficult concepts in maths	46	20	15	18	292	105	2.78	agree

From table 1 above, items 1,2,3,4 and 5 were accepted since their mean rating of teachers responses on these items which are 3.08, 3.12, 2.74, 2.76 and 2.78 were above the cut off mean 2.50. This implies that the likely benefits that would be derived from integration technology in teaching and learning of Mathematics in pre-primary schools are as follows: It would make people to learn faster, understand difficult concepts, have access to wide range of learning materials and help teachers to teach effectively.

Research Question 2: What are the factors affecting the effective use of technology in teaching and learning of Mathematics in pre-primary schools in Onitsha South LGA?

Table 2: The mean (X) rating of teachers' responses on the factors affecting the effective use of technology in teaching and learning of Mathematics in pre-primary schools.

S/N	ITEMS	SA	A	D	SD	FX	N	X	RK
6	Enough computer sets are not available for use in teaching and learning	47	20	17	16	298	105	2.84	agree
7	Most teachers do not have adequate knowledge of ICT	49	21	15	20	309	105	2.94	agree
8	Poor funding of Primary Education is a major problem of ICT usage	50	24	15	19	321	105	3.06	agree
9	Shortage of software packages for teaching and learning of Maths	48	23	20	15	316	105	3.01	agree
10	Lack of motivation to use ICT by teachers to teach in the classroom	49	25	18	17	324	105	3.09	agree

From table 2 above items 6,7,8,9 and 10 were accepted since the mean rating of teachers responses on these items 2.84, 2.94, 3.06, 3.01 and 3.09 were above the cut off mean 2.50. It could be inferred that the major factors affecting the effective use of technology in teaching and learning of Mathematics in pre-primary schools are: inadequate computer sets, inadequate knowledge of ICT by teachers, poor funding of Primary education, shortage of software packages for teaching and learning of Mathematics and lack of motivation to use ICT by teachers to teach in the classroom.

Research Question 3: What are the possible ways of enhancing the effective use of technology in teaching and learning of Mathematics in pre-primary schools in Onitsha South LGA ?

Table 3: The mean (X) rating of teachers' responses on the possible ways of enhancing the effective use of technology in teaching and learning of Mathematics in pre-primary schools

S/N	ITEMS	SA	A	D	SD	FX	N	X	RK
11	Government should provide enough computer set to Pre-primary schools	48	26	14	19	317	105	3.02	agree
12	Pre-primary school teachers should attend regular training on ICT	49	25	12	11	306	105	2.91	agree
13	Software packages should be provided for teaching and learning in pre-primary schools	49	24	16	12	312	105	2.97	agree
14	Computer instructors should be employed to assist the teachers	46	27	16	13	310	105	2.95	agree
15	More funds should be allocated to the Primary education sector	44	29	20	13	316	105	3.01	agree

From table 3, item 11,12,13,14 and 15 were accepted since the mean rating of teachers responses on these items 3.02, 2.91, 2.97, 2.95 and 3.01 were above the cut-off mean of 2.50. This implies that government should provide enough computer sets and projectors to schools. Pre-primary school teachers should attend regular ICT training. Software packages should be provided for teaching and learning of Mathematics in pre-primary schools. In addition, government should employ qualified computer instructors to assist pre-primary school teachers.

Discussion of findings

The objective of this research work is to find out whether technology is likely to enhance the effective teaching and learning of Mathematics in pre-primary Schools in Onitsha south Local Government Area of Anambra state. Questionnaires were distributed to the pre-primary schools teachers in the LGA by the researcher who went into fact finding. In summary therefore, the following research results were obtained. With respect to the likely benefits of technology in teaching and learning of Mathematics in pre-primary schools, the researcher discovered that information and communication technology would help children to learn better, technology would equally help teachers to teach very well and at the same time would help children to access to various learning materials. So the above findings were in line with earlier study carried out by

Awana (2009) which revealed that information and communication technology will facilitate the learning of Mathematic. Similarly, Obong (2009) also reported that technology facilitate the teaching and learning of Mathematics in pre-primary schools.

With regard to research question two, the researcher discovered that the major factors affecting the effective use of technology in teaching and learning Mathematics in pre-primary schools include the following: inadequate number of computer sets, poor knowledge of computer by the teachers, poor funding of primary education sector by the government, shortage of software packages for teaching and learning and lack of motivation to use technology to teach by Pre-primary teachers.

In research question three, it was discovered that the factor affecting the use of technology in teaching and learning of Mathematics in pre-primary schools can be overcome by providing adequate computer sets with projectors to schools, employment of well qualified computer instructors and regular supply of electricity to schools to empower the computer sets. The above findings were in line with earlier study carried out by Nwankwo (2009) which suggested that government should employ qualified computer instructors to train teachers in computer usage. Similarly, Whawo (2009) suggested that government should provide adequate computer sets to school in order to enhance the effective teaching and learning of Mathematics in pre-primary schools.

Conclusion

The desire to increase children's achievement in Mathematics is worthwhile. Having seen the benefits of technology and impact to the teaching and learning of Mathematics in the pre-primary schools, it becomes imperative to use technology as an indispensable tool in the teaching and learning process as such should be made available in adequate proportions to primary education sector to enhance the effective teaching of Mathematics.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Software packages for learning of Mathematics at the pre-primary school should be provided for teaching and learning by government.
2. The government should make efforts to provide these technology facilities in pre-primary schools for use in Mathematics instruction as well as other subjects.
3. There should be an effective monitoring system to ensure that the facilities already provided in schools are properly maintained and utilized for making Mathematics learning more creative.
4. Teachers should be sensitized on the need to use these facilities in Mathematics teaching and learning by the government.

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UPCYCLING ACTIVITIES FOR ENVIRONMENTAL AWARENESS AND CREATIVITY AMONG PRIMARY SCHOOL PUPILS IN NIGERIA

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Abstract

This study examines upcycling activities for environmental awareness and creativity among primary school pupils in Nigeria. Upcycling, a process that involves creatively repurposing waste materials, offers a dual advantage of reducing waste and fostering creativity. It explores the integration of upcycling activities into the curriculum of Nigerian primary schools as an educational tool for promoting environmental sustainability and developing creativity. It highlights the environmental challenges faced by Nigeria, including inadequate waste management and growing waste accumulation and positions upcycling as a practical and cost-effective solution. Through upcycling, primary school pupils can gain hands-on experience in waste reduction, resource conservation, and innovative problem-solving. This approach not only raises awareness about environmental issues but also nurtures critical thinking, collaboration and artistic expression. The paper also addresses the challenges of implementing upcycling in Nigerian schools, such as limited resources, lack of teacher training and inconsistent waste management systems and offers useful suggestions for overcoming these barriers through partnerships, curriculum integration and localised solutions. By incorporating upcycling into primary education, Nigerian schools can empower pupils to take responsibility for their environment, inspire creative thinking and contribute to the broader goal of sustainable development. This initiative presents an opportunity to shape a generation of environmentally conscious, innovative and proactive citizens prepared to tackle the ecological challenges of the future.

Keywords: *Upcycling, Environmental Awareness, Creativity, Sustainable Practices, Critical Thinking*

Introduction

In an era defined by rapid industrialisation, urbanisation and increasing waste accumulation, environmental degradation has emerged as one of the most urgent global challenges. Across the world, ecosystems are under strain from factors like deforestation, pollution, and climate change, with developing countries like Nigeria facing unique and often intensified environmental challenges. Nigeria, a country of over 200 million people, grapples with an escalating waste crisis, where urban centers, such as Lagos, generate millions of tons of waste annually (World Bank, 2018). In many parts of Nigeria, waste management systems are either inefficient or nonexistent, resulting in widespread pollution, clogged waterways and environmental hazards. As waste continues to accumulate in landfills, rivers and streets, the situation has become a critical issue for public health and sustainability (Akinyemi and Adeyemi 2020).

Given the environmental pressures facing the nation, the need for environmental education is more pressing than ever. Schools serve as key institutions for shaping the values and habits of future generations. For countries like Nigeria, with limited resources for large-scale environmental interventions, education remains a powerful tool for sustainable development. Environmental education can cultivate a sense of environmental responsibility and encourage sustainable practices from an early age (UNESCO, 2019). This is where upcycling, the practice of creatively reusing materials that would otherwise be discarded can play a transformative role. Upcycling, as an innovative approach to waste management and creative expression, offers a practical, hands-on means of addressing both environmental and educational needs in Nigeria's schools.

Upcycling not only offers a solution to the growing problem of waste, but also serves as a means to cultivate creativity and critical thinking among students. Through upcycling activities, children can repurpose materials like plastic bottles, cardboard, fabric scraps and newspapers into functional or decorative items. These projects not only help to reduce the burden on waste disposal systems but also offer a valuable opportunity to teach students about sustainability, the finite nature of resources, and the importance of conservation (Liu et al., 2021). Moreover, upcycling fosters a sense of ownership and responsibility for the environment, encouraging children to view waste not as garbage but as valuable material that can be transformed into something new and useful (Barton, 2017).

The educational benefits of upcycling extend beyond environmental awareness to the development of essential skills for the 21st century. Creativity, critical thinking, problem-solving, and collaboration are just a few of the skills that are enhanced through upcycling projects. As students work together to design and create new objects from discarded materials, they learn to think creatively, collaborate with peers, and find solutions to challenges. These experiences contribute not only to their cognitive development but also to their ability to engage meaningfully with real-world problems (Nicolson, 2020). For Nigerian pupils, upcycling activities can help bridge the gap between traditional educational methods and more innovative approaches that encourage hands-on learning and creativity.

The relevance of upcycling in the Nigerian context is heightened by the local waste challenges faced by communities across the country. In Nigerian cities, especially in informal settlements and rural areas, large amounts of recyclable materials like plastics, glasses, cellophanes and papers are often left to pile up due to inadequate waste management systems (Ogundele & Ayodele, 2020).

This waste often ends up in landfills or, worse, in rivers and streams, contributing to environmental degradation and health risks. Upcycling provides an immediate, local solution by utilising readily available materials and transforming them into useful or artistic products. For example, plastic bottles can be used to create school supplies, while old clothes can be turned into bags or decorations. By involving children in such activities, schools can directly address local waste problems and teach students to value waste as a resource rather than a problem.

In addition to environmental benefits, upcycling also aligns with Nigeria's cultural values and creativity. The country has a rich tradition of craftsmanship, and many communities have long relied on traditional methods of recycling and reusing materials (Eze & Ogu, 2021). Integrating these practices into the classroom through upcycling not only teaches students about modern environmental challenges but also connects them to cultural heritage and local resourcefulness. Nigerian children can benefit from this intersection of traditional knowledge and modern sustainability practices, leading to an enriched learning experience that respects both their heritage and the urgent need for environmental stewardship.

As Nigeria continues to face pressing challenges related to waste management, climate change and environmental sustainability, upcycling offers a cost-effective, practical, and culturally relevant solution. *By teaching children about the benefits of reuse, recycling and resourcefulness, schools can help shape a generation that is more environmentally conscious, creative and prepared to tackle the environmental challenges of the future.* The study also explores the significant potential of upcycling as an educational tool in Nigerian primary schools, examining its impact on environmental awareness, creativity and critical thinking development.

Through this work, we seek to argue that integrating upcycling activities into primary school curricula is a proactive strategy for not only addressing waste problems but also for fostering a culture of sustainability. By equipping children with the skills, knowledge, and mindset to reimagine waste as a valuable resource, Nigerian schools can play a pivotal role in shaping a sustainable future for the country.

Environmental Challenges in Nigeria

Nigeria, like many developing countries, is grappling with significant environmental challenges due to rapid urbanisation, poor waste management systems and industrial growth. According to recent studies, urbanisation has increased waste generation in Nigerian cities, contributing to an escalating waste crisis. The country produces millions of tons of waste annually, a large proportion of which ends up in landfills, streets and bodies of water. This improperly managed waste leads to various environmental issues such as pollution, flooding, and the spread of diseases (Ogundele & Ayodele, 2020).

In Nigerian cities like Lagos, Abuja, Port Harcourt, Benin City, etc., waste management infrastructure is often insufficient, leading to the accumulation of refuse in public spaces. Inadequate waste disposal systems result in the contamination of water sources, as waste is often dumped directly into rivers, leading to poor water quality and the spread of diseases like cholera and malaria. This highlights the urgent need for sustainable waste management practices and responsible consumption in Nigeria.

The country's rapid industrialisation and increased consumption of disposable goods have intensified environmental degradation. Improper disposal of non-biodegradable materials like

plastic bottles, bags, and packaging has further contributed to pollution. These materials take hundreds of years to decompose, causing long-term harm to ecosystems.

In this context, it becomes evident that environmental education, particularly at the primary school level, is crucial in addressing these environmental issues. By educating children about waste reduction, resource conservation and responsible consumption, we can create a generation of environmentally conscious citizens. Upcycling, as a sustainable practice, provides a hands-on solution for reducing waste and fostering a culture of sustainability.

Upcycling

Upcycling refers to the creative reuse of materials or products that would otherwise be discarded. Unlike recycling, which breaks down materials into their raw components for reuse, upcycling transforms waste into new products or art without significant alteration of the original material. This process has significant environmental benefits, particularly in waste reduction and resource conservation.

Upcycling is an effective way to teach children about sustainability, as it allows them to directly engage with materials they might typically throw away. By repurposing items like plastic bottles, cardboard, old fabrics and newspapers, pupils can make useful objects, such as toys, decorations or even functional tools. This hands-on learning approach offers pupils a tangible understanding of how recycling and waste reduction can be integrated into daily life.

Benefits of upcycling in primary education

1. Upcycling directly addresses waste accumulation, as it involves reusing materials instead of sending them to landfills or incinerators. By turning discarded materials into useful products, pupils can see firsthand how small efforts can contribute to larger environmental benefits.

2. Upcycling activities emphasize the finite nature of natural resources. Children learn that many materials, such as plastic, fabric and metal, are produced from non-renewable resources. Through upcycling, pupils understand the importance of minimising the extraction of new resources and reducing the consumption of single-use products.

3. As children engage in upcycling, they develop a sense of responsibility toward the planet. They learn that individual actions can contribute to reducing pollution and conserving natural resources.

4. Upcycling can also be culturally relevant in Nigerian schools. Teachers can incorporate local materials, such as woven baskets, palm fronds and discarded wood, into upcycling projects. These materials reflect the local culture and environment, making the lessons more relatable to the pupils (Eze & Ogu, 2021).

Through upcycling activities, children can understand the connections between the environment and their everyday lives. By engaging in these activities, they develop a deeper understanding of environmental sustainability and its practical application.

Creativity and Critical Thinking Development

Upcycling activities offer more than just environmental education; they also foster the development of creativity and critical thinking among pupils. The act of transforming discarded materials into new products requires problem-solving skills, imagination and the ability to think

outside the box. By repurposing materials, children explore their creative potential and discover innovative ways to use everyday objects.

Upcycling allows pupils to express their creativity by transforming mundane objects into art. For example, children can turn plastic bottles into vases, old newspapers into collage art or fabric scraps into fashionable accessories. These activities give pupils the opportunity to develop their artistic abilities and design skills (Nicolson, 2020). By experimenting with different materials and techniques, children gain confidence in their creative expression. Many upcycling activities are designed to be carried out in groups, encouraging collaborative learning. As students work together on upcycling projects, they share ideas, negotiate designs, and combine their skills to produce a final product. This process fosters teamwork, communication, and a sense of community, which are essential life skills (Osborne, 2019).

Upcycling also encourages pupils to think critically about the objects around them. By asking themselves how everyday materials can be reused or repurposed, pupils develop problem-solving skills. This type of thinking challenges conventional views on waste and value, encouraging children to question the disposability of products and consider alternative uses for items (Nicolson, 2020).

In addition to creativity, upcycling encourages pupils to approach problems in new ways, fostering a mindset that values resourcefulness and sustainability.

Integrating Upcycling into the Nigerian School Curriculum

Integrating upcycling into the Nigerian primary school curriculum would require collaboration between educators, policymakers and local communities. Schools can organise upcycling

workshops, competitions and projects that engage students in creating art and functional objects from discarded materials. These activities can be incorporated into existing subjects such as Art, Mathematics, English studies, Basic science and technology, Social studies and Civic education ensuring that upcycling is not only an extracurricular activity but an integral part of the educational experience. Nigerian educational authorities should consider incorporating upcycling and sustainability into the national primary school curriculum. This would ensure that every child, regardless of location or socioeconomic background, receives consistent and comprehensive education on environmental issues. Government-backed initiatives and frameworks can guide schools in creating standardised programmes for sustainability education. Schools can start by introducing simple upcycling projects that do not require significant investment. For example, students can create decorative items from bottle caps, turn old t-shirts into bags, or repurpose cardboard boxes into storage units. Such projects promote creativity while fostering sustainable practices (Eze & Ogu, 2021). Schools can collaborate with local businesses and NGOs to source materials for upcycling projects. Partnerships with waste management organisations can help schools access recyclable materials, while collaborations with local artisans can introduce pupils to traditional upcycling practices that use locally available resources.

Challenges to Upcycling Implementation in Nigerian Schools

Despite the potential benefits, there are several challenges to implementing upcycling activities in Nigerian schools. These include:

1. Teachers and school administrators may not be aware of the educational potential of upcycling. Without proper training, they may be hesitant to integrate upcycling into the curriculum.

2. Many schools in Nigeria face financial constraints that limit access to basic educational materials. Without adequate funding, schools may struggle to implement upcycling programmes that require certain tools or materials.

3. In Nigeria, there is a lack of proper waste collection and sorting infrastructure, which makes sourcing materials for upcycling difficult. In rural and underfunded urban schools, the availability of suitable discarded materials may be limited, affecting the feasibility of upcycling projects.

4. There may also be cultural perceptions around waste and the reuse of materials. In some Nigerian communities, waste is often seen as undesirable and upcycling may not immediately resonate as an educational tool. Changing these perceptions requires concerted efforts from educators, community leaders and government stakeholders to emphasize the value of reusing and reimagining materials as resources for creativity.

Conclusion

Upcycling presents a powerful tool for enhancing environmental awareness and nurturing creativity among Nigerian primary school pupils. By reimagining waste as a valuable resource, upcycling not only addresses pressing environmental challenges like waste accumulation and pollution but also fosters a sense of responsibility and creativity in pupils.

Incorporating upcycling into the school curriculum can help children develop critical life skills, including problem-solving, teamwork, and innovative thinking. As Nigeria faces mounting environmental issues, integrating upcycling in primary schools offers a proactive, low-cost, and culturally relevant solution that can foster long-term environmental sustainability. For upcycling to become a mainstream educational tool, there must be concerted efforts from government,

educators, and communities to overcome challenges such as limited resources, inconsistent waste management, and cultural perceptions. Through partnerships, teacher training, and policy integration, upcycling can transform Nigerian schools into hubs of environmental education, inspiring the next generation to lead sustainable lives and contribute to a greener future for Nigeria.

Suggestions

1. There should be specialised training and sensitisation programmes to equip educators with the knowledge and skills needed to lead upcycling initiatives. Teachers should be made aware of the environmental impact of waste and the benefits of teaching children to reuse materials creatively. Workshops, seminars, and online resources can be developed to ensure that teachers understand how to incorporate upcycling into their lessons.

2. Primary schools in Nigeria should collaborate with local businesses, environmental NGOs and government agencies to obtain resources for upcycling projects. Local artisans and craftsmen can be brought in as mentors, sharing their knowledge of traditional crafts and upcycling practices.

3. The Nigerian government should consider formally integrating upcycling and sustainability into the national curriculum for primary education. By introducing environmental education as a core component of the curriculum, students across the country will have access to standardised instruction on waste reduction and resource conservation.

4. The Nigerian government should allocate resources to schools for environmental education programmes, particularly those that involve hands-on activities like upcycling. Funding can be used to provide schools with the necessary tools, materials and equipment to carry out these activities. Government should also incentivise schools that successfully implement upcycling

programmes through grants, awards or recognition, ensuring that more schools across the country adopt these initiatives.

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CHALLENGES OF INTEGRATING TECHNOLOGY IN TEACHING MATHEMATICS IN PRIMARY SCHOOL: PERSPECTIVES FROM TEACHERS IN AWKA SOUTH LOCAL GOVERNMENT EDUCATION AUTHORITY

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Abstract

The integration of technology into primary school mathematics teaching presents numerous challenges for teachers. Despite the potential benefits of technology in enhancing mathematics instruction, teachers face significant obstacles in its implementation. This study aims to identify and analyse the specific challenges teachers encounter when integrating technology into primary school mathematics lessons. Two research questions guided the study. A survey research design was adopted for the study. A 30-item questionnaire titled Challenges of Integrating Technology in Primary School Mathematics Teaching (CITPSMT), was validated by three experts and pilot-tested (Cronbach's $\alpha = 0.79–0.85$), was used for data collection. The population of study was 1440 teachers in the 45 primary schools in Awka South Local Government Education Authority. The sample was 150 teachers randomly drawn from primary schools in Awka South LGEA. Mean and standard deviation were used to analyse the data collected. The study revealed that teachers struggle with issues related to insufficient training, lack of resources, and difficulties in aligning technology with curriculum standards. These findings highlight the need for targeted professional development and increased investment in technological resources to support teachers in effectively integrating technology into their mathematics teaching. It was recommended among others that schools should invest in comprehensive professional development programs that address both the technical and pedagogical aspects of technology use and adequate digital tools should be provided to schools by the government.

Keywords: *Technology Integration, Mathematics Teaching, Primary Education, Teaching Challenges*

Introduction

In recent years, there has been a significant push towards integrating technology into classroom instruction to enhance pupils learning outcomes (Smith and Anderson, 2022). This shift is particularly evident in mathematics education, where digital tools can offer interactive and engaging ways to explore mathematical concepts (Jones, 2023).

Mathematics is the systematic study of patterns, structures, numbers, space, quantity, and change. As a foundational subject, it plays a critical role in the cognitive and intellectual development of children and is essential for daily life, underpinning many disciplines within science, technology, engineering, and mathematics (STEM). Proficiency in mathematics fosters enhanced problem-solving skills, logical reasoning, and abstract thinking (Brown and Davis, 2021). These competencies are vital not only for academic achievement but also for effective navigation of a technology-driven society.

Mathematics education equips children with key abilities, including: Numerical Literacy (understanding numbers, operations, and applications); Analytical Skills (logically analyzing situations and solving problems); Spatial Awareness (manipulating shapes and spaces, crucial for fields like engineering); Critical Thinking (evaluating arguments and making reasoned decisions); and Confidence and Independence (built through problem-solving and independent thinking) (Smith and Anderson, 2022).

Given its fundamental nature, the integration of technology into mathematics education holds significant potential to transform teaching and learning processes, making them more interactive, engaging, and accessible to diverse learners.

The integration of technology into educational settings has become a global trend, driven by the promise of enhancing pupils engagement and learning outcomes (Smith and Anderson, 2020). In mathematics education, digital tools such as interactive whiteboards, educational

software, and online resources can facilitate a deeper understanding of mathematical concepts through interactive and visual learning experiences (Higgins, Xiao and Katsipataki, 2022).

Despite the potential benefits, teachers often face significant challenges when integrating technology into their teaching practices. These challenges include insufficient training, limited access to technological resources, and difficulties in aligning technological tools with existing curriculum standards (Brown and Davis, 2021). However, despite the potential benefits, many teachers face considerable challenges in integrating technology effectively into their mathematics teaching practices (Brown and Davis, 2021). According to Kopcha (2014) these challenges include limited access to resources, insufficient training, and difficulties in aligning technology with curriculum standards. This study aims to identify and analyze the specific challenges that primary school mathematics teachers encounter when integrating technology into their lessons. It seeks to understand the nature of these challenges and their impact on teaching practices and pupils outcomes.

The integration of technology in primary school mathematics education holds great promise for enhancing teaching and learning. However, it also presents significant challenges that need to be addressed to realize its full potential. This study aims to explore these challenges, understand their impact on teaching practices and student outcomes, and identify practical solutions to support teachers and improve mathematics education in primary schools.

By investigating these aspects, the study contributes to the broader goal of improving educational practices and ensuring that all children have the opportunity to develop strong mathematical skills in a technology-rich learning environment and effective strategies to support teachers in integrating technology, thereby enhancing the quality of mathematics education. This study will also contribute to the literature by providing detailed insights into the obstacles teachers face and suggesting practical solutions to overcome them. Hence there

is the need to consider the challenges of integrating technology in teaching mathematics in Awka South Local Government Education Authority.

Purpose of the Study

The following objectives guided the study:

1. Identify the challenges encountered by teachers in teaching mathematics in primary schools in Awka South Local Government Education Authority.
2. Identify the solutions for overcoming the identified challenges encountered in integrating technology in teaching mathematics in Primary Schools in Awka South Local Government Education Authority.

Research Questions

The following research questions guided the study:

1. What are the challenges encountered by teachers in integrating technology in teaching mathematics in Primary Schools in Awka South Local Government Education Authority?
2. What are the possible solutions to the Challenges encountered by teachers in Integrating technology in teaching mathematics in Primary Schools in Awka South Local Government Education Authority?

Methods

Survey design was used for the research. The study was carried out in Awka South LGEA. The population of study was 1440 teachers in the 45 primary schools in Awka South LGEA. The sample comprise 150 teachers which was randomly drawn from primary schools in Awka South LGEA using simple random technique. 15 schools were randomly drawn from the 45 public primary schools in Awka South LGEA. Then 10 teachers were randomly drawn from

each of the 15 primary schools. Structured questionnaire titled 'Teachers Perspective of Challenges of Integrating Technology in Primary School Mathematics Teaching' which was dully validated by three experts, two from the department of Early Childhood and Primary Education, and one from Measurement and Evaluation in the department of Education Foundation, all from Faculty of Education, Nnamdi Azikiwe University, Awka was used for data collection. The instrument was pilot tested in Awka North using 30 teachers. The copies of the questionnaire were administered to the teachers directly by the researchers assisted by two (2) research assistants. The reliability coefficients for the three clusters were 0.83, 0.82 and 0.81 respectively. The overall reliability coefficient of the instrument obtained was 0.82 using Cronbach Alpha correlation coefficient. The instrument contained 30-items. The questionnaire was divided into 3 sections. Section A collected essential demographic information about the participating teachers while B sought teachers' opinions on Challenges of Integrating Technology in teaching mathematics in Primary Schools while section C elicited teachers' opinions on the possible solutions that can be implemented to overcome the challenges of integrating technology into teaching mathematics in primary school. The items were developed on a 4-point Lirket scale of strongly disagree, Disagree, Agree, Strongly Agree with values of 1, 2, 3, and 4 respectively. Mean and standard deviation was used for the analysis and a mean score of 2.50 and above indicated agreement while a mean score below 2.50 indicated disagreement.

Results

Research Question One: What are the challenges encountered by teachers in integrating technology in teaching mathematics in Primary Schools in Awka South Local Government Education Authority?

Table 1: Mean and Standard Deviation of the mean responses of Teachers on the challenges faced by teachers in integrating technology into primary school mathematics teaching.

S/N	Challenges faced by teachers in integrating technology into primary school mathematics teaching include:	X	SD	DECISION
1.	Lack of adequate training programs for teachers to effectively use technology in their teaching.	**3.80**	**1.56**	**Agreed**
2.	Inadequate availability of digital devices such as computers, tablets, and interactive whiteboards in classrooms.	**3.92**	**1.53**	**Agreed**
3.	Difficulty in aligning technological tools and resources with existing curriculum standards and learning objectives.	**2.56**	**1.82**	**Agreed**
4.	Lack of time for teachers to learn and integrate new technologies into their teaching practices.	**2.89**	**1.77**	**Agreed**
5.	Frequent technical problems such as software glitches, hardware malfunctions, and connectivity issues.	**3.86**	**1.46**	**Agreed**
6.	Challenges in maintaining pupils engagement and managing classroom behavior when using technology.	**3.12**	**1.52**	**Agreed**
7.	Differences in pupils technological proficiency and comfort levels with using digital tools.	**2.75**	**1.63**	**Agreed**
8.	Limited funding for purchasing and maintaining technological resources.	**3.98**	**1.44**	**Agreed**
9.	Resistance from teachers who are accustomed to traditional teaching methods and may be reluctant to adopt new technologies.	**2.69**	**1.96**	**Agreed**
10.	Difficulty in assessing the effectiveness of technology integration in enhancing student learning.	**3.86**	**1.06**	**Agreed**

Table 1 shows that all the items, 1-10 are above measure of 2.50 which is the cut-off for an item. Therefore this shows that the teachers agreed with all the items as the challenges faced by teachers in integrating technology into primary school mathematics teaching. These include: Insufficient Training and Professional Development, Limited Access to Technological

Resources, Alignment with Curriculum Standards, Time Constraints, Varied Student Skill Levels, Funding and Budget Constraints, Resistance to Change among others.

Research Question Two: What are the possible solutions to the Challenges encountered by teachers in Integrating technology in teaching mathematics in Primary Schools in Awka South Local Government Education Authority?

Table 2: Mean and Standard Deviation of the mean responses of Teachers on what practical solutions can be implemented to overcome the challenges of integrating technology into primary school mathematics teaching.

S/N	Practical solutions that can be implemented to overcome the challenges of integrating technology into primary school mathematics teaching include:	X	SD	DECISION
11	Develop comprehensive training programs that focus on the effective use of technology in mathematics teaching, including hands-on workshops and continuous professional development.	**3.50**	**1.52**	**Agreed**
12.	Ensure that schools are equipped with adequate digital devices such as computers, tablets, and interactive whiteboards to meet student needs.	**3.30**	**1.60**	**Agreed**
13.	Invest in robust internet infrastructure to provide reliable and fast internet access in all areas of the school.	**3.94**	**1.50**	**Agreed**
14.	Establish a dedicated technical support team to promptly address and resolve technical issues, ensuring minimal disruption to teaching.	**3.87**	**1.66**	**Agreed**
15.	Foster collaborative learning communities or professional learning networks where teachers can share experiences, resources, and best practices for using technology in teaching.	**2.56**	**1.88**	**Agreed**
16.	Provide access to high-quality, curriculum-aligned educational software and applications that support interactive and engaging mathematics learning.	**3.85**	**1.23**	**Agreed**
17.	Implement programs that help pupils develop proficiency in using technology, ensuring they can effectively engage with digital tools in their learning.	**3.00**	**1.27**	**Agreed**
18.	Provide teachers with tools and materials to assess and evaluate the effectiveness of technology integration in enhancing student learning outcomes.	**3.23**	**1.43**	**Agreed**
19.	Tailor professional development programs to address the specific needs and skill levels of teachers, ensuring that training is relevant and effective	**2.75**	**1.89**	**Agreed**
20.	Develop and provide resources that help teachers align technological tools with curriculum standards and learning objectives, making integration seamless.	**2.76**	**1.88**	**Agreed**

Table 2 shows that all the items, 10-20 are above measure of 2.50 which is the cut-off for an item. Therefore this shows that the teachers agreed with all the items as the possible solutions that can be implemented to overcome the challenges of integrating technology into primary school mathematics teaching. These include**:** Enhanced Teacher Training Programs, Provision of Sufficient Technological Resources, Improved Internet Infrastructure, Collaborative Learning Communities, Access to Quality Educational Software and Apps among others.

Discussion

The study identified several significant challenges faced by teachers, which included insufficient training, limited resources, technical issues, and resistance to change. The finding showed that majority of teachers reported insufficient training and cited limited resources as a major barrier. Related data supported these findings, revealing a need for more comprehensive professional development and better technological infrastructure.

The high percentage of teachers reporting insufficient training suggests a critical gap in professional development programs. This finding aligns with the theory of technological pedagogical content knowledge (TPACK), which emphasizes the need for teachers to develop skills at the intersection of technology, pedagogy, and content knowledge (Hew & Brush, 2017). Without adequate training, teachers struggle to effectively integrate technology into their mathematics instruction, leading to suboptimal teaching practices and learning outcomes.

The findings of this study are consistent with previous research indicating that insufficient training and limited resources are major barriers to technology integration (Hew & Brush, 2017). However, this study also highlights the significant impact of technical issues and resistance to change, which were less emphasized in earlier studies. This may be due to the

rapid advancement of technology and the increasing demands on teachers to keep up with new tools and applications.

Further findings also indicated that the possible solutions to challenges of integrating technology into primary school mathematics teaching include: enhanced teacher training programs, provision of sufficient technological resources, improved internet infrastructure, collaborative learning communities, access to quality educational software and apps among others. This finding is in line with Warschauer, Knobel,, and Stone, (2014) who observed that integrating technology in mathematics education, adequate training should be provided for teachers, and digital tools such as interactive whiteboards, educational software, and online resources which facilitate a deeper understanding of mathematical concepts through interactive and visual learning experiences should be made available in schools.

The findings underscore the need for targeted professional development programs that focus on both the technical and pedagogical aspects of technology integration.

Conclusion

This study identified several challenges faced by primary school mathematics teachers in integrating technology into their teaching. Insufficient training, limited resources, technical issues, and resistance to change emerged as significant barriers. The findings showed that a majority of teachers reported inadequate training and limited resources as major obstacles. This further highlighted the need for targeted professional development and better technological infrastructure.

Recommendations

Based on the findings, the following recommendations were made

1. Schools should invest in comprehensive professional development programs that address both the technical and pedagogical aspects of technology use. Increasing investments in technological resources is crucial to ensure teachers have the necessary tools to enhance their teaching.
2. Adequate digital tools should be provided to schools by the Government.
3. Policymakers should allocate more funds to improve technological infrastructure in schools and support initiatives that promote innovative teaching practices.

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PARENTS' AWARENESS AND RESPONSES TO SIBLINGS' VICTIMIZATION OF CHILDREN WITH DISABILITIES

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Abstract

This study investigates parents' awareness and responses to sibling victimization of children with disabilities. Despite being a recurring issue in Nigerian households, there is limited data on this subject. Research indicates that children with disabilities are over three times more likely to be abused or neglected than their non-disabled peers and face a greater risk of serious harm. The study utilized a descriptive survey design, guided by four research questions. The population consisted of 121 parents of children with disabilities from four Special Schools in Ibadan North Local Government Area, Oyo State. Data were collected using the Bystander Intervention on Bullying and Sexual Victimization Scale developed by Nickerson et al. (2014) and analyzed with SPSS (Statistical Package for Social Science). Descriptive analysis included frequency and percentage. The findings revealed a significant incidence of sibling victimization among children with disabilities, with 90% of parents demonstrating a high level of awareness regarding the issue. 84.3% of respondents reported that their child with a disability experienced victimization by a sibling. The study recommended targeted intervention strategies and educational programs aimed at enhancing parental awareness and capacity to identify and effectively respond to sibling victimization. Such initiatives are essential for the safety and overall well-being of children with disabilities.

Keywords*: Children, Disabilities, Awareness, Siblings, Victimization*

Introduction

Children are exceptional in their own ways. Some children are born with a disabling health condition or impairment, while others may develop disability as a result of illness, injury or poor nutrition. Disability affects a large percentage of people throughout the world. According to the World Health Organization (WHO,2013), around 15% of the world population, which is more than one billion individuals, are living with one form of disability or impairment. It is estimated that 5% of this population are children. The definition of disability varies due to its uniqueness. There are no universally accepted definitions of disabilities. The World Health Organization (WHO, 2010) describes disability as an interaction between the individual's physical body and the qualities of the society in which the individual lives. This definition sees disabilities as an umbrella term, covering impairments, activity limitations and participation restrictions. Disability also includes physical impairment such as mobility, hearing, visual, language difficulties and developmental delays and intellectual impairments such as cerebral palsy, spina bifida, muscular dystrophy, traumatic spinal cord injury, and down syndrome, which affects a person's behaviour, emotional expression and learning ability. The environment in which children are nurtured is very important for their overall development. Having a healthy and secure environment is crucial for the growth of any child, and even more so for children with disabilities. Children with disabilities are best cared for and nurtured within their family environment, and they should never be mistreated solely due to their disability. In other words, they need care and affection to grow up happy and should also be provided with access to a range of services and supports specifically designed to help them achieve their full potential. Children are profoundly affected by their experiences, and the structure of the family, whether traditional or non-traditional, in which they grow up can determine whether they are victimized or not.

Victimization of children was first coined by Dan Olweus in 1993. He defined victimization as an act of harassment, which can be verbal, psychological or physical, of the victim to cause harm to the victim (Olweus, 2010). Tippett & Wolke (2015) define victimization as an episode of the following: verbal (name-calling), property (destroying or taking property), psychological (feeling afraid), or physical (hitting, biting, kicking, with or without injury). The World Health Organization (2010) defines victimization against children as all forms of physical and emotional ill-treatment, sexual abuse, neglect and exploitation that results in actual or potential harm to the child's health, development or dignity. Maguire et al. (2019) opined that victimization can be physical: practicing aggressive actions such as kicking, hitting, pushing, touching or sexual assaults. It can also be verbal: threatening verbally as calling names, abusing symbolically, taunting, among others. Children are exposed to victimization in so many forms, which includes exploitation, neglect, physical violence, sexual, psychological and many more. The children with disabilities are not exempted from these types of victimization. Children with disabilities are at least three times more likely to be abused or neglected than their peers without disabilities.

According to Lo, Ho, Wong, Tung et al (2019), every year, approximately one billion children around the world experience victimization. Victimization is encountered in two modes: directly and indirectly. Direct victimization refers to relatively open attacks on a victim, while indirect victimization refers to social isolation or intentional exclusion from a group (Olweus, 2010). Not all forms of disabilities carry the same level of risk, and not all children diagnosed with the same type of disability experience victimization equally. For example, children with disabilities that affect conduct, such as attention deficit/hyperactivity disorder, may be vulnerable to physical victimization by parents, siblings or caregivers who may become frustrated by their behaviour. Children who rely on adults for their care, as well as children who are nonverbal or hearing impaired, may be more likely than others to experience neglect or sexual victimization (Centers for Disease Control and Prevention, 2017). Consistent with definitions in studies of sibling and peer victimization (Brendgen

et al., 2016; Espelage, Low, & De La Rue, 2012; Tippett & Wolke, 2015), victimization as an episode of the following: verbal (e.g., name-calling), property (e.g., destroying or taking property), psychological (e.g., feeling afraid), or physical (hitting, biting, kicking, with or without injury).

Sibling Victimization has been defined repeatedly as aggressive behaviour between siblings that is intended to inflict harm either physical, psychological, socially, or property based and involves perceived or real power imbalance (Wolke et al., 2015). It covers assaults perpetrated by a juvenile sibling living in the same household. Physical victimization (e.g. hitting, biting, slapping, shoving, tickling) occurs when a sibling intentionally hurts or kills the other sibling, including also behaviours such as pushing, pulling hair, scratching and pinching, kicking, beating with objects (Tompsett, et al. 2016) or weapons handling (Banks, Kelly, Kyegombe, Kuper and Devries 2017). Psychological victimization (e.g. teasing, ridiculing, insulting) is a nonphysical behaviour that intends to psychologically or emotionally harm (e.g. lower self-esteem, raise anxiety), such as name-calling, teasing, and threatening injury to the person, pets, or property (Caspi, 2012). However, because of the absence of physical evidence, psychological abuse is difficult to detect unlike sexual victimization or incest (e.g. attempted penetration, intercourse, rape). There is no generally accepted definition of sibling incest (Carlson, 2011); however, sibling incest has received scant attention in the research and, as such, little is understood about the complexities of sexual interaction among siblings (Caspi, 2012). Sibling incest has been described as including inappropriate behaviours such as fondling or sexual contact; indecent exposure; masturbation; oral sex; anal sex; exposure to pornography (Morrill, 2014; Carvalho, 2013).

Conflict, even when it involves aggression, between siblings is often seen as a normal and harmless component of sibling relationships (Caspi, 2012). As a consequence, sibling victimization is one of the least studied forms of within-family violence (Kiselica & Morrill-Richards, 2007), even though it occurs more often than maltreatment by a parent. While sibling aggression has been reported as the most frequent form of interpersonal violence (Finkelhor, Turner, Shattuck, & Hamby, 2015),

aggression between siblings is still largely normalized and overlooked by parents and health professionals (Krienert & Walsh, 2011; Khan & Rogers, 2015; Pickering & Sanders, 2015). The investigation of sibling aggression remains hindered by the inconsistent use of terminology and the absence of a universally accepted definition among scholars (Wolke et al., 2015a). Terms such as conflict, victimization, rivalry, aggression, violence, abuse, and bullying have often been used interchangeably in the literature (Finkelhor, Turner, & Ormrod, 2006; Tippett & Wolke, 2015a; Morrill et al., 2017; Toseeb, McChesney, & Wolke, 2018), leading to conceptual ambiguity and methodological challenges. This lack of clarity complicates efforts to delineate "normal" sibling conflict from more serious forms of sibling victimization. Nevertheless, a growing body of empirical evidence supports the notion that sibling conflict and sibling victimization are distinct phenomena, each with different trajectories and implications for child development and well-being (Kiselica & Morrill-Richards, 2007). Given these conceptual inconsistencies, the need to distinguish between normative sibling interactions and harmful victimization becomes especially urgent in the context of children with disabilities, who are more vulnerable to intra-family aggression and less likely to be protected by standard disciplinary norms. Despite growing recognition of the unique risks faced by children with disabilities, limited research has explored how parents perceive and respond to sibling-perpetrated victimization within this population. Therefore, this study investigates parents' awareness and responses to sibling victimization of children with disabilities.

Statement of the Problem

All children are vulnerable; children with disabilities are in a heightened state of vulnerability and need to be protected. Researchers have long awareness the seemingly increased rates of abuse and maltreatment in individuals with disability, but it is clear that there exists a paucity of research concerning sibling victimization of children with disabilities. Although only a few studies have been conducted on the connection between victimization and developmental disabilities, all of these

studies were majorly in other countries. Due to very few researches conducted in Nigeria regarding this issue, this paper investigated the current level of knowledge and understanding among parents on the issue of sibling victimization of children with disabilities, as well as their responses to the victimization.

Purpose of the Study

The objective of this study is to assess the level of awareness and response of parents to sibling victimization of children with disability in Ibadan North Local Government, Oyo State.

To actualize the objectives above, the study is designed to:

1. Examine the types of victimization that exist between children with disabilities and their siblings.
2. Determine the causes of victimization between children with disabilities and their siblings.
3. Explore the level of awareness of parents on sibling victimization of children with disabilities.
4. Find out the responses of parents to siblings' victimization of children with disabilities.

Research Questions

1. What are the types of victimization that exist between children with disabilities and their siblings?
2. What are the causes of victimization between children with disabilities and their siblings?
3. What is the parents' level of awareness of sibling victimization of children with disabilities?
4. What are the responses of Parents to sibling victimization of children with disabilities?

Method

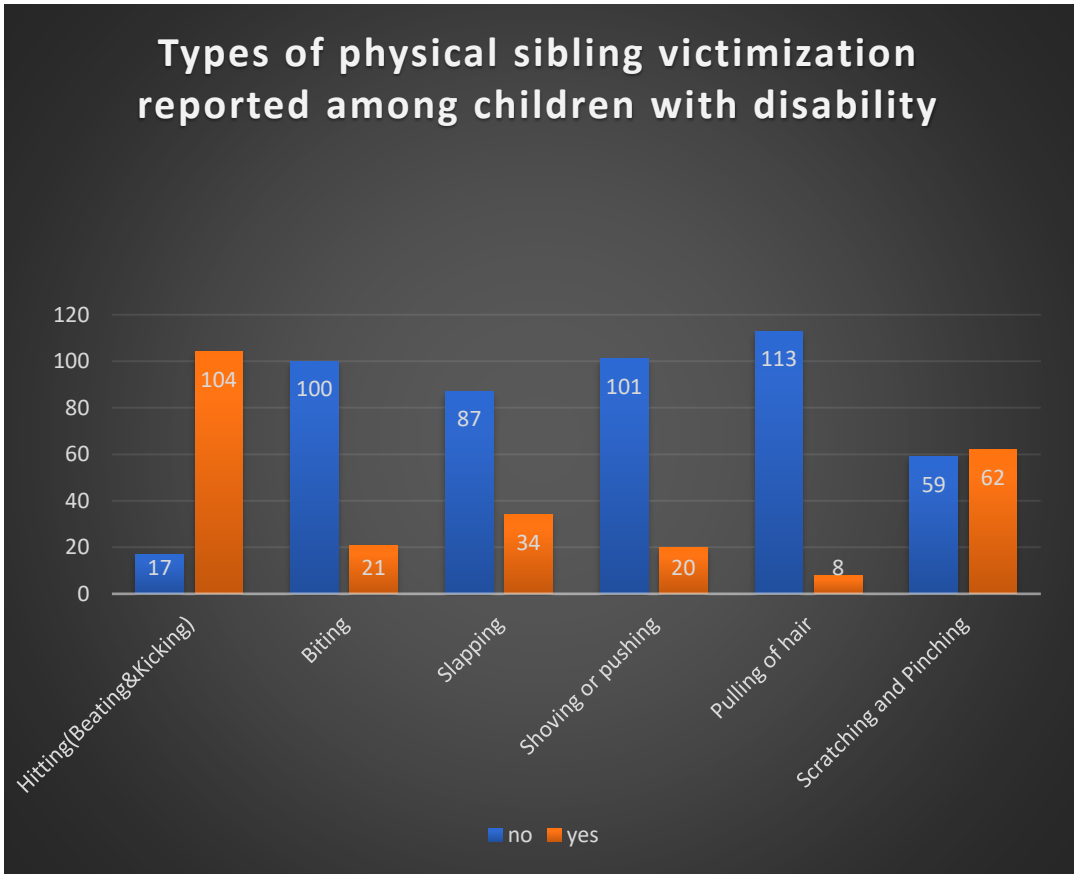
The study adopted a descriptive survey design. A multi-stage sampling method was used in this study. Purposive sample was used to select Ibadan North Local Government from the 11 Local Government Areas in Ibadan. This is because Ibadan North has the highest concentration of Special Schools in Ibadan. The headquarters of the LGA is Bodija. Ibadan North LGA is an urban center. Notable landmarks in Ibadan North LGA include the University of Ibadan and the University College Hospital. The target population for this study consisted of parents of children with disabilities in schools of disabilities in Ibadan North, with a total number of 874 (Ministry of Education & Schools for children with disabilities, Ibadan North, 2025). Simple random sampling was used to select 4 schools for children with disabilities in Ibadan North LG through balloting. Simple random sampling was used to select 121 Parents of children with disabilities who served as respondents. The study adapted the Bystander Intervention on Bullying and Sexual Victimization Scale, an instrument developed by Nickerson, Aloe, Livingston and Feeley (2014). This study instrument was titled Parents' Awareness and Responses to Siblings Victimization of Children with Disabilities. The instrument was validated by three experts, two from the Department of Home Science and Management and one from the Department of Statistics in the Federal University of Agriculture, Abeokuta. The advice of the experts helped the researchers to modify and select the final instrument items used for the study. The reliability of the instruments was determined using Cronbach's Alpha. Based on Standardized items, the overall coefficient result was 0.73, showing that the questionnaire is reliable. A pilot study was carried out in Oni Memorial Hospital, Ring-road, Ibadan, which is not part of the study area but similar to it, using 20 parents. The researchers administered the questionnaires with the help of 2 research assistants who were adequately briefed on how to administer the instruments. The researchers adopted an on-the-spot delivery method during the administration. This exercise lasted for three weeks and 121 copies of the questionnaire

were successfully retrieved. The data were analyzed using SPSS (Statistical Package for Social Science). Descriptive analysis comprises the frequency and percentage.

Results

Research question 1: What are the types of victimization that exist between children with disabilities and their siblings?

Table 1: Types of victimization



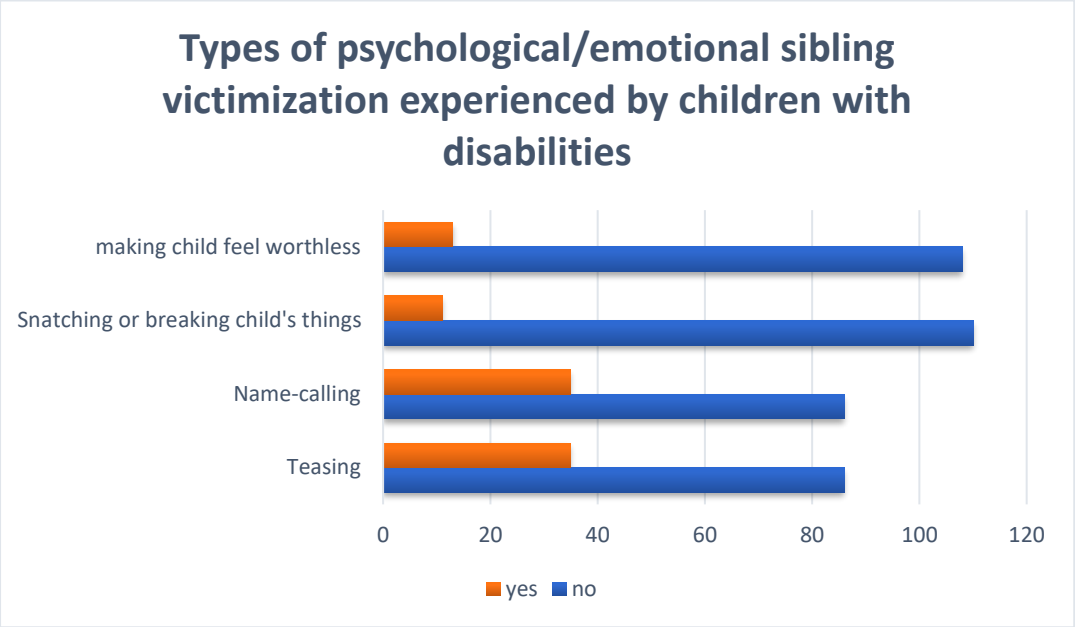


Figure 1: Emotional victimization among children with disabilities as reported by respondents

Table 1 revealed that physical forms of victimization experienced by children with disability are hitting/beating 104(85.9%), biting 21(17.4%), slapping 34(28.1%), shoving or pushing 20(16.5%), pulling of hair 8(6.6%) and scratching/pinching 62(16.5%). Figure 1 shows that respondents reported that the children also experienced emotional victimization such as teasing 35(28.9%), name-calling 35(28.9%), snatching or breaking things important to the child 11(9.1%), and making the child feel worthless 13(10.7%). The finding is supported by the study of Espelage, et al (2012) stated that large number of children are exposed to multiple forms of victimization. When asked about sexual victimization experienced by children with disabilities, almost all the respondents reported that this was not taking place, only one respondent reported the occurrence of indiscriminate touching of children with disability. It is also in line with the report of WHO (2013) on child maltreatment.

Research question 2: What are the causes of victimization between children with disabilities and their siblings?

Table 2: Causes of victimization

ITEMS	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
When parents favour or scapegoat one sibling compared to others	5(4.13%)	6(4.96%)	2(1.65%)	17(14.05%)	91(75.21%)
When parents show more love and pay more attention to child with disability.	9(7.44%)	15 (12.39%)	0	32(26.45%)	65(53.72%)
When parents are unable to secure stable employment	12(9.92%)	8(6.61%)	3(2.48%)	28(23.14%)	70(57.85%)
When parents are unable to meet basic needs due to un/underemployment.	20(16.53%)	40(33.06%)	2(1.65%)	25(20.66%)	34(28.10%)
When siblings fail to accept the child with disability as a member of the family	15(12.39%)	17(14.05%)	3(2.48%)	14(11.57%)	72(59.51%)
When siblings show a lack of empathy towards the child with disability	16(13.22%)	20(16.53%)	2(1.65%)	13(10.74%)	70(57.85%)
Previous exposure of siblings to victimization	17(14.05%)	60(49.59%)	20(16.53%)	13(10.74%)	11(9.09%)
When parents do not provide expectations for/ enforce healthy child behaviours	12(9.92%)	10(8.26%)	4(3.31%)	20(16.53%)	75(61.98%)
When one sibling is expected to parent others	5(4.13%)	13(10.74%)	3(2.48%)	20(16.53%)	80(66.12%)
When parents are physically/emotionally unavailable	4(3.31%)	5(4.13%)	0	16(13.22%)	96(79.34%)

Table 2 shows the opinion of respondents on the causes of sibling victimization of children with disabilities. it can be seen from table above 91(71.21%) respondents believed that parents favouring one sibling against others, and when parents show more love and pay more attention to a child with a disability, it could result in sibling victimization. This reveals that respondents believe that

differential treatment can result in sibling victimization of children with disability. The results also show that sibling victimization of children with disabilities can be caused by a lack of empathy by siblings 70(57.85%). The findings are supported by Morri-Richard and Stephen (2010), who in their study of the relationship between sibling maltreatment and college students' sense of well-being, reported that sibling abuse exists and it is connected to other issues in the family

Research question 3: What is the level of awareness of parents of sibling victimization of children with disabilities?

Table 3: Parents' Knowledge of sibling victimization of children with disabilities

	Not at all Aware	Slightly Aware	Somewhat Aware	Moderately Aware	Extremely Aware
I am aware that sibling victimization of children with disability exist	2 (1.65%)	10 (8.26%)	0	13 (10.74%)	96 (79.34%)
I am aware that sibling victimization occurs between children with disability and their siblings	1 (0.83%)	3 (2.48%)	0	9 (7.43%)	108 (89.26%)
I have witnessed victimization between children with disability and their siblings	6 (4.95%)	8 (6.61%)	0	42 (34.74%)	65 (53.70%)
I believe that a child with disability experiencing sibling victimization needs help	5 (4.13%)	8 (6.61%)	0	12 (9.92%)	96 (79.34%)
I believe sibling victimization of children with disability is hurtful and damaging.	3 (2.48%)	8 (6.61%)	0	11 (9.09%)	99 (81.82%)

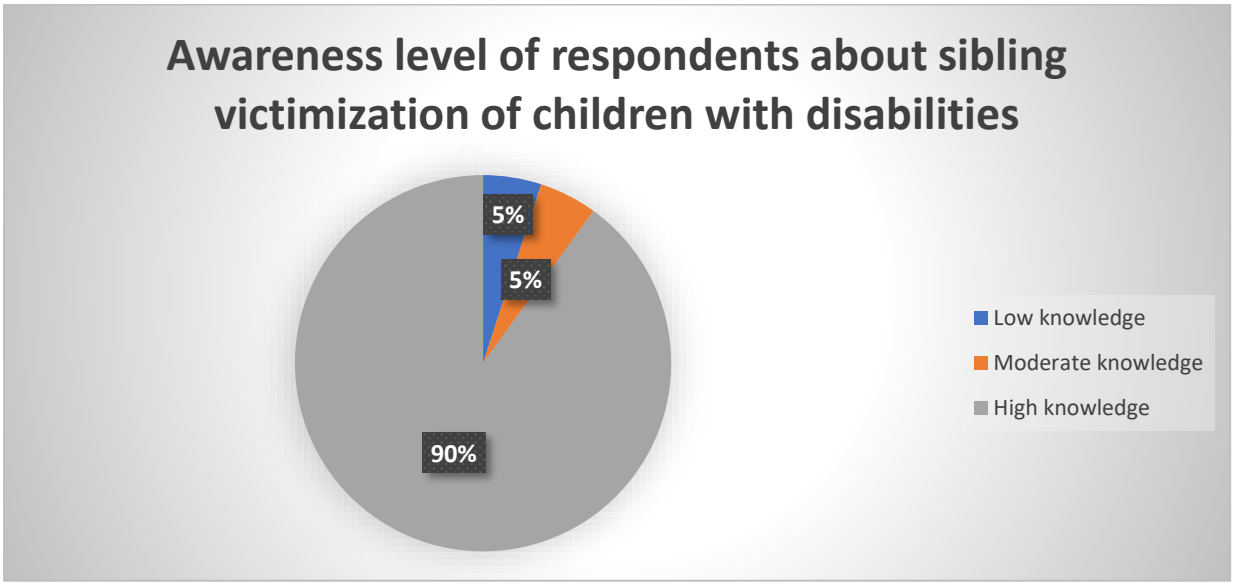


Figure 2: Pie chart showing the awareness level of respondents about sibling victimization of children with disabilities

The findings presented in Table 3 and illustrated by the pie chart indicate a notably high level of parental awareness regarding the occurrence of sibling victimization involving children with disabilities. Specifically, 79.34% of the surveyed parents acknowledged that such victimization exists, and 53.70% reported having personally observed or experienced it within their families. Furthermore, the pie chart suggests that up to 90% of respondents were aware that sibling victimization takes place among their own children, reflecting a significant recognition of this issue at the household level.

These results are consistent with earlier studies that underscore the prevalence of sibling aggression and the tendency for such behaviour to be underreported or normalized within families (Tippett & Wolke, 2015). The elevated awareness levels reported in this study may reflect growing sensitivity to disability-related concerns and the increasing advocacy for inclusive and protective family practices. Nevertheless, awareness alone does not necessarily translate into effective intervention. Toseeb, McChesney, and Wolke (2018) observed that children with disabilities are at heightened

risk of intra-family victimization due to factors such as communication difficulties, behavioural differences, and perceived differential treatment by caregivers.

Research question 4: What are the responses of Parents to sibling victimization of children with disabilities?

Table 4: Responses of Parents to sibling victimization of children with disabilities

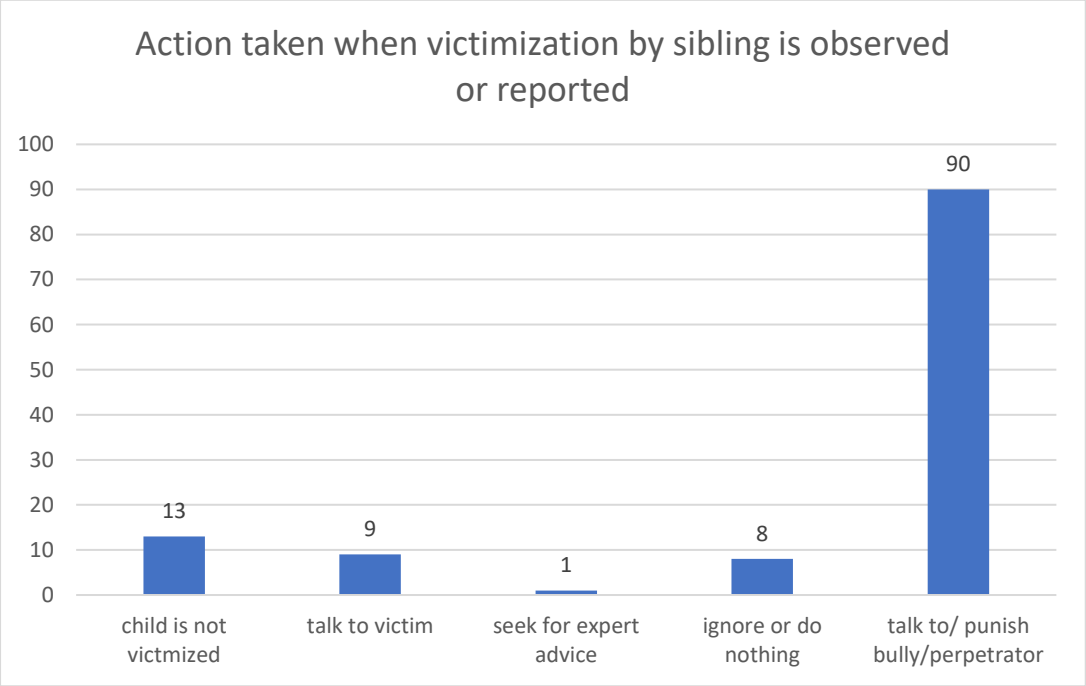


Figure 3: Respondents' response to the question about actions taken when a child with disability reports sibling victimization or it is observed by the parent.

Figure 3 shows that 90 (74.4%) respondents reported that they talked to or punished the bully/perpetrator, while 9 (7.4%) talked to the victim, 8 (6.6%) ignored or did nothing and only one person reported seeking expert advice when they observed victimization or it was reported. This finding is corroborated by the study of Wolke, Tippett, and Dantchev (2015) who in a study of sibling bullying, reported that victims of sibling abuse experience psychological effects especially children with disability.

Conclusion

This study concluded that the majority of children with disability experienced victimization from their siblings, such as hitting/beating 104(85.9%), biting 21(17.4%), and slapping 34(28.1%). The causes of victimization, according to the study, are parents favouring one child against others, parents showing love/attention to one child against another sibling, and parents' lack of job. That parents know about sibling victimization of children with disability. The majority of Parents respond to Sibling Victimization of children with disability by punishing or talking to the perpetrators, while some parents do not talk at all.

Recommendations

Following the findings of the study, some recommendations were made:

- Families of children with disabilities should be educated about disability and the importance of promoting positive relationships between siblings.
- Governments and Ministries of Education should develop intervention programs that can sensitize parents by providing them with education on various forms of sibling victimization, its consequences and effective intervention strategies so that they can create a safe environment for all their children.
- Early and urgent identification and intervention support for victimized children with disability to improve the overall well-being of the children.
- Developing specific programs and support groups to assist and aid victims of sibling victimization.

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EFFECT OF PHONICS READING METHOD ON PUPILS' ACHIEVEMENT IN WORD RECOGNITION IN AWKA SOUTH LOCAL GOVERNMENT AREA EDUCATION AUTHORITY

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Abstract

The study investigated the effect of phonics reading method on pupils' achievement in word recognition in Awka South Local Education Authority. The study was guided by two research questions and three research hypotheses. The study adopted a quasi-experimental x2 factorial research design. The population of the study comprised 4750 (2,350 female pupils and 2400 male pupils. 144 primary one pupils were randomly sampled using the multi-stage sampling procedure. The instrument used for data collection was structured questionnaire drafted by the researcher. It was titled Word Recognition Achievement Test (WRAT) Face and content validation of the instrument was established by three education experts. The reliability of the instrument was established using pilot study of twenty (20) primary one pupils in Awka South who were not part of the selected sample. Scores generated from the 20 pupils were applied to K – R 20 (Kuder Richardson) formula. The internal consistency co-efficient of 0.77 was obtained. Data collected were analyzed using mean while ANCOVA was used to test the hypotheses at 0.05 level of significance. Findings revealed that female primary one pupil improved in their word recognition than their male counterpart. It was also found among others that the mean word recognition scores of those taught reading using phonics significantly improved the word recognition of primary one pupil when phonics method was used in than when whole language was used. The study recommended among others that curriculum planners should introduce the use of more than one approach of teaching to primary school curriculum in order to bring in learning experiences that would see both the male and female child exposed to different learning activities to ensure a healthy competition among the male and the female pupils.

Keywords: *phonics reading method, academic achievement, pupils' achievement, word recognition*

Introduction

Phonics reading refers to the instructional method that teaches pupils the relationships between letters and sounds to enhance their decoding skills for reading. Through phonics, pupils learn how to sound out letters and blend them into words, which is fundamental for word recognition and reading fluency (Ehri and McCormick, 2017). Phonics is a method of teaching reading and spelling that focuses on the sounds of letters and groups. Phonics instruction has been found to be especially effective in the early stages of reading development, providing pupils with the tools to approach unfamiliar words systematically (Adewale, 2021). The basic idea is that kids learn the sounds of letters and then learn to combine those sounds to form words, so, for example, a child might first learn the sounds of the letters C-A-T and then learn to blend the sounds to make the word cat, the goal is to make it easier for kids to learn to read and spell words by breaking them down into smaller pieces.

The importance of phonics reading lies in its ability to equip pupils with critical reading skills that enable them to decode and comprehend written texts effectively. Phonics helps children to break down complex words into simpler sounds, facilitating smoother and faster reading (Snowling and Hulme, 2017). Phonics instruction has also been associated with long-term improvements in literacy, leading to better academic performance overall (Ehindero, 2020). In addition, it promotes confidence in reading by allowing pupils to independently read new words (Amadi and Okeke, 2022).

Improvements in phonics reading are indicated by various factors, including increased word recognition, faster reading fluency, and enhanced comprehension skills. When pupils are able to decode unfamiliar words more quickly and accurately, it is a strong sign that their phonics skills have advanced (Obiageli, 2019). Another determinant is the ability to read aloud without

significant pauses or errors, demonstrating proficiency in sound-letter correspondence (Han and Torgerson, 2020). Continuous assessment, such as reading tests and performance in classroom activities, can also highlight the effectiveness of phonics instruction (Ehindero, 2020). Hence, the improvement in word recognition is what makes pupils to be efficient readers and learners

Word recognition is the ability to identify and understand written words with ease. It is a fundamental skill in literacy development, as it enables learners to decode and comprehend texts effectively. Word recognition is an essential component of fluent reading and involves both phonological processing and visual identification of words (Ehri, 2014). It allows pupils to move from reading individual letters to recognizing words as whole units, thus improving their reading speed and comprehension (Snowling and Hulme, 2017). The development of word recognition skills directly impacts a child's ability to become a proficient reader (Ehindero, 2020). Word recognition is a part of the abilities that shows efficiency in phonics reading which is one of the most effective approaches for improving reading abilities among primary school pupils which improves their achievement

Academic achievement refers to the extent to which a student has attained their educational goals. It is typically measured through standardized tests, classroom performance, and mastery of subject matter (Okoro, 2020). Several factors determine pupils' academic achievement, including socio-economic background, teacher quality, learning environment, and parental involvement (Ude and Nwafor, 2023). Effective teaching strategies, such as the use of the phonics reading method, have been shown to significantly improve pupils' academic performance in reading and literacy (Torgesen, 2015). Thus, academic achievement is a multifaceted construct influenced by both individual abilities, external environmental factors location and gender.

Gender refers to the social and cultural roles, behaviors, and attributes that a society considers appropriate for men and women (Duru and Okeke, 2021). It is distinct from biological sex and includes the roles individuals take on within society based on societal expectations. Gender can influence access to education, learning experiences, and academic performance (Obiageli, 2019). In educational settings, especially in early childhood, differences in reading achievement between boys and girls have been noted, with varying factors contributing to these differences (Han and Torgerson, 2020). Gender has been identified as a factor that can influence pupils' achievement in phonics reading and word recognition. Research suggests that girls tend to outperform boys in early literacy skills, including phonics, potentially due to greater linguistic development and classroom engagement (Duru and Okeke, 2021). However, when phonics reading instruction is implemented effectively, it has been shown to benefit both genders equally, reducing any gaps in reading performance (Obiageli, 2019). Structured, explicit phonics instruction ensures that both boys and girls develop the foundational skills necessary for word recognition, although societal expectations and engagement levels may still affect outcomes (Han and Torgerson, 2020).

Several factors can influence the effectiveness of phonics reading among pupils. One such factor is the quality of instruction, as teachers with proper training in phonics tend to deliver more effective lessons (Amadi and Okeke, 2022). Socio-economic status also plays a role, with children from higher-income families often having more access to reading materials and support at home (Agu, 2019). Additionally, the learning environment, including the availability of phonics resources and time allocated to reading instruction, significantly impacts pupils' achievement (Okeke, 2020). Cultural and linguistic backgrounds may also affect how easily children grasp phonics concepts (Obiageli, 2019).

Also, students encounter too many unknown words while reading, fluency is slowed because the reader must apply decoding strategies before moving forward with reading the remainder of the text. Students need to decode words quickly and accurately in order to reduce cognitive strain, and to devote mental faculties to comprehension. It is described as a purely human and non -instinctive method of communicating ideas, emotions and desires by means of a system of voluntary produced symbols. The Universal Basic Education Commission (2010) describes the spelling method as an approach by which children are taught to read the words by first spelling them. First, they are taught to recognize individual letters of the alphabet, master them, and even sing them out so as to recall all the 26 letters individually. Thereafter they are taught to build up words by spelling them. This method is still widely used in many Nigerian schools. Some of the weaknesses associated with this method are that it makes children stick to spelling of all words in their effort to read, even much later in life. When this is an established practice children are essentially slowed down.

However, despite the importance of education at the different levels including primary/basic level, pupils still perform below expectations in subject contents like word recognition. A similar issue observed, lies in the fact were pupils grapple with the fundamental skill of reading, resulting in significant reading difficulties. As a result of this, pupils perform below expectation in termly examinations and entrance examinations, and this remains an unsatisfactory state of affairs. This poor achievement has prevailed despite efforts made by teachers and school administrators to improve pupils' achievement in word recognition.

Presently, teachers in classrooms in Awka South Local Government Area Education Authority are observed to use the conventional method of teaching. As against the phonics method which has been proven effective by some studies in different areas. Hence, it is imperative to

consider and shift focus to a different approach that could prepare pupils for a future effective problem-solving ability, thoughtful decision making and lifelong meaningful learning. Hence the choice for a learner-centered approach like phonics reading method/language method which introduces connected words and sentences to learners remains imperative. Children are not taught to first recognize individual letters, rather words and short sentences are presented as language units and the pupils are led to say what they mean. The backdrop observed in academic achievement of pupils in primary school informs the present study which determines effect of phonics reading method on pupils' achievement in word recognition in Awka South Local Government Area Education Authority.

Purpose of the Study

The purpose of this study is to find out the effect of phonics reading method on pupils' achievement in word recognition in Awka South Local Government Education Authority of Anambra state. Specifically, the study determined:

1. The pre –test mean word recognition scores of pupils taught reading using phonics method and those taught using whole language.
2. The post- test mean word recognition scores of male and female pupils taught reading using phonics method.
3. The interaction effect of gender and teaching method on pupils' word recognition achievement scores

Research questions

The following research questions guided the study.

1. What is the difference in the pre - test mean word recognition scores of pupils taught reading using phonics method and those taught using whole language?

2. What is the difference in the post-test mean word recognition scores of male and female pupils taught reading using phonics and whole language?

Null hypotheses

The following null hypotheses were formulated to guide the study and were tested at 0.05 level of significance.

1. There is no significant difference in the pre –test mean word recognition scores of pupils taught reading using phonics method and those taught using whole language.
2. There is no significant difference in the mean post-test mean word recognition score of male and female pupils taught reading using phonics and whole language.
3. There is no significant Interaction effect of gender and teaching method on pupils' word recognition achievement scores.

Methods

Design of the study: This study adopted a quasi-experimental x2 factorial research design, employing intact classes as the unit of analysis.

Area of the study: The study was carried out in Awka South Local Education Authority of Anambra State of Nigeria.

Population of the study: The target population for the study consisted of primary one pupil in Awka South Local Government Area of Anambra State numbering 4750 and it comprises of 2,350 female pupils and 2400 male pupils (Source Anambra State Universal Basic Education Board 2023 ASUBEB 2023).

Sample and sampling technique: The researcher used multi-stage sampling approach to constitute a representative sample. In the first stage, one primary school was selected using the purposive sampling technique due to the reason that the sample represents the population of

interest (primary one pupils) and allows the researcher to maintain intact groups for the intervention. From this school, two intact classes of primary 1 (A) and (B) were used. In the second stage, from the intact class, the simple random sampling techniques was used to select 44 males and 34 females and 38 males and 28 females from primary 1 (A) and (B). In the third stage, the simple random technique precisely flip of a coin was used to assign experimental treatment to one of the class, while the other class was assigned control treatment. Therefore, samples of 144 primary school pupils (82 males & 62 females) were used which will serve as experimental and control school. Out of this sample, 78 belonged to the experimental group with 44 male and 34 female.

Development of instrument: The instrument named Word Recognition Achievement Test (WRAT) was developed by the researcher and used for data collection. The validities were carried out on the instrument.

Validation of Instrument: The instrument was validated by three experts, two from the Department of Early Childhood and Primary Education, the other from the Department of Educational Foundations both departments are in faculty of education in Nnamdi Azikiwe University, Awka.

Reliability of the instrument: A trial test was carried out to ascertain the reliability of the instrument, to establish the internal consistency of word recognition achievement test, scores generated from the 20 pupils were applied to K – R 20 (Kuder Richardson) formula. The internal consistency co-efficient of 0.77 was obtained.

Experimental procedure: The experimental procedure involved a pre-experimental orientation organized for the teachers to be used for the study. Separate orientation was organized for the

teachers in the two groups. The researcher also monitored the study to ensure uniform approaches by the teachers. The pupils were pre-tested using WRAT.

Method of Data Analysis: Mean was used to answer the research questions. While the Analysis of co-variance (ANCOVA) was used to test the hypotheses.

Results

Research question 1: What is the difference in the pre - test mean word recognition scores of pupils taught reading using phonics method and those taught using whole language?

Table 1

Mean word recognition Scores of pupils taught reading using phonics method and those taught using whole language.

	Pretest			**Post-test**			
Group	N	Mean	S.D	N	Mean	S.D	Mean diff
Whole language	66	32.28	11.33	66	36.11	12.56	12.85
Phonics method	78	32.70	11.36	78	46.97	16.95	0.78

Result Table 1 revealed that the mean scores of primary one pupil's taught reading using whole language had mean scores of 32.28 and 36.11 for pretest and post-test respectively with difference of 3.83 while pupils taught with phonic method had mean scores of 32.70 and 46.97 for pre-test and post-test respectively with mean difference of 14.27. The above result gave a mean difference of 10.44 from the two groups in favour of those taught with phonics method. The result revealed that the mean score of primary one pupil when phonics was used is far better than when' whole language was used.

Research question 2: What is the difference in the post-test mean word recognition scores of male and female pupils taught reading using phonics and whole language?

Table 2
Mean word recognition Scores male and female pupils taught reading using phonics method

	Pretest			**Posttest**			
Gender	N	Mean	S.D	N	Mean	S.D	diff
Male	44	32.05	10.91	44	42.00	16.11	9.95
Female	34	33.17	11.7	34	50.57	16.77	17.40

In Table 2, the result showed mean score of primary one male pupils' taught reading using phonics method to be 32.05 and 42.00 for pretest and post-test respectively and mean difference of 9.95 while females had mean score of 33.17 and 50.57 for pretest and post-test respectively with mean difference of 17.40. The result revealed that female primary one pupil improved in their word recognition than their male counterpart.

Hypotheses Testing

Hypothesis 1: There is no significant difference in the pre –test mean word recognition scores of pupils taught reading using phonics method and those taught using whole language.

Table 3
Analysis of covariance between the mean scores of primary one pupils taught reading using phonics method and those taught using whole language.

Source	Type III Sum of Squares	df	Mean Square	F	p-value	Decision
Corrected Model	7166.668[a]	4	1791.667	8.174	.000	
Intercept	24833.721	1	24833.721	113.296	.000	
Pretest	407.084	1	407.084	1.857	.175	
Method	4321.908	1	4321.908	19.717	.000	Significance
Gender	939.885	1	939.885	4.288	.040	
Method * Gender	536.363	1	536.363	2.447	.120	
Error	36605.309	167	219.193			
Total	347012.000	172				
Corrected Total	43771.977	171				

The result in Table 3 showed that there is a significant difference in the mean word recognition scores of primary one pupil's taught reading phonics and those taught with whole language. This is because the p-value (.000) is less than the level of significant (0.05). Based on the above, the null hypothesis was rejected.

Hypothesis 2: There is no significant difference in the mean word recognition score of male and female pupils taught reading using phonics.

Table 4
Analysis of covariance between the mean word recognition scores of primary one male and female pupils taught reading using phonics method

Source	Type III Sum of Squares	df	Mean Square	F	p-value	Decision
Corrected Model	1854.332[a]	2	927.166	3.396	.038	
Intercept	25199.900	1	25199.900	92.294	.000	
Pretest	189.579	1	189.579	.694	.407	
Gender	1715.930	1	1715.930	6.285	.014	Significant
Error	24573.625	90	273.040			
Total	231677.000	93				
Corrected Total	26427.957	92				

a. R Squared = .070 (Adjusted R Squared = .050)

The result in Table 4 showed that there is a statistically significant difference in the mean word recognition score of male and female primary one pupil's taught reading phonics and those taught with whole language. This is because the p-value (.014) is less than the level of significant (0.05). Based on the above, the null hypothesis was rejected.

Hypotheses 3: There is no significant Interaction effect of gender and teaching method on pupils' word recognition achievement scores.

Table 5
Analysis of covariance of Interaction effect of gender and teaching method on pupils' word recognition scores of primary one pupil.

Source	Type III Sum of Squares	df	Mean Square	F	p-value	Decision
Corrected Model	7166.668[a]	4	1791.667	8.174	.000	
Intercept	24833.721	1	24833.721	113.296	.000	
Pretest	407.084	1	407.084	1.857	.175	
Method	4321.908	1	4321.908	19.717	.000	
Gender	939.885	1	939.885	4.288	.040	
Method * Gender	536.363	1	536.363	2.447	.120	Not significant
Error	36605.309	167	219.193			
Total	347012.000	172				
Corrected Total	43771.977	171				

Table 5 result shows that there is no statistically significant Interaction effect of gender and teaching method on pupils' word recognition scores of primary one pupil. This is so because, the p-value (.120) is greater than the level of significant (0.05). Based on this, the null hypothesis was not rejected. The researcher therefore concluded that there is no statistically significant difference.

Discussion of Findings

Effect of phonic method on word recognition achievement of pupils

The findings of this study in respect to research question one to ascertain the mean word recognition scores of primary one pupil's taught reading using phonics method and those taught using whole language of pupils showed that the mean word recognition scores of those taught reading using phonics significantly improved the word recognition of primary one pupil when phonics method was used in than when whole language was used.

The above findings of this study agreed with the findings of Omile and Akabuogu (2021) who carried out a study explore the effectiveness of phonics instructional approach on pupils'

achievement in reading in Awka South area of Anambra State. The researchers found out that pupils taught reading using the phonics instructional approach achieved significantly higher than those taught with the look and say method. In addition, the findings of Suggate (2014) are in alignment with the findings of the present study as it implies that phonics method improves primary early word recognition of primary school pupils than the use of whole language method. The findings of the present study further align with Abdullahi (2017) who found that phonemic awareness instructional strategy had significant effect in improving the reading ability and reading behaviours of the pupils. Finally, adoption of the strategy was recommended for teachers teaching reading as an intervention programme for pupils with reading difficulty.

Effect of phonic method on word recognition achievement of male and female pupils

The findings of this study in respect to research question two revealed that the that female primary one pupil significantly improved in their word recognition than their male counterpart. This is because the merge of their mean difference of 17.40 on word recognition when phonics method was used was very high compared to the mean difference of their male counterparts who had a mean difference of 9.95.

The findings is in conformity with the findings of Ajayi and Adedigba (2020) whos' result showed that there was significant main effect of treatment on pupils' learning outcome in reading. Also, there was no significant effect of school type on pupils' learning outcome in Reading in Ado-Ekiti. There was no significant effect of gender on pupils' learning outcome. There was no significant interaction effect of treatment and gender on pupils' learning outcome in Reading. Additionally, gender differences in reading interests suggest that girls are more likely to perform well in passage comprehension of text regardless of content, whereas boys are more likely both to exert themselves and perform better in comprehension if the passage is meaningful to them (Logan,

et al. 2015). The instructional texts associated with a synthetic phonics approach to teaching reading, often referred to as basal readers, contain a restricted vocabulary which may lead to a lack of authenticity and meaning, with less motivational content for boys.

Conclusion

The researchers conclude that, use of Phonics method in teaching reading among primary one pupil improved the mean score of their word recognition than the use of whole language. This is evident from the fact that this group taught with phonics method had mean scores significantly higher than the group taught with whole language method. The results of the study indicated that the use of phonics method in teaching a child helps the child to improve in reading. But this should not be the sole approach to teaching reading to all children and boys in particular. Instead, a more balanced approach should be taken whereby children are taught additional strategies including the use of whole-word and more visual techniques. Perhaps more importantly, the instructional texts young children are given to read should reflect the more natural language of 'real' books.

Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations were made that:

1. That curriculum planners should introduce the use of more than one approach of teaching to primary school curriculum in order to bring in learning experiences that would see both the male and female child exposed to different learning activities to ensure a healthy competition among the male and the female pupils.
2. Primary school teachers should also ensure that both male and female pupils are given equal attention during teaching so that male pupils can be able to perform or improve in

reading other activities. Varieties of methods should be adopted by classroom teachers so as to avoid one sided improvement in learning.

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INFLUENCE OF CLASSROOM ENVIRONMENT ON PUPILS' ENGAGEMENT IN MATHEMATICS IN PANKSHIN LOCAL GOVERNMENT EDUCATION AUTHORITY, PLATEAU STATE

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Abstract

This study investigates the influence of the classroom environment on pupils' engagement in mathematics in Pankshin Local Government Education Authority, Plateau State. The research was guided by two research questions and adopts a descriptive survey design. The population of the study comprised of 527 public primary school teachers from the 15 public primary schools in Pankshin LGEA. The sample size of the study comprised of 150 teachers from the 15 public primary schools in Pankshin LGEA, using a simple random sampling technique. Data were collected using a 24-item structured questionnaire: Influence of Learning Environment on Pupils Engagement in Mathematics (ICLEPEM) on a 4-point Likert scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Disagree (1 point). The instrument was validated for face and content validity by three experts, two from the Department of Early Childhood Care and Education and one expert from the Measurement and Evaluation unit of the Department of Educational Foundations at the Federal College of Education, Pankshin. Reliability was established using Cronbach's Alpha, resulting to a reliability coefficient of 0.87 which shows that the instrument is reliable. The research questions were analysed using the mean statistics where a mean score of 2.50 and above indicated agreed and a mean score below 2.50 indicated a disagreed. Findings of the study revealed that classroom environment is important because it improves pupil's critical thinking in mathematics and encourages active learning and participation among others. Findings also revealed that the influence of classroom environment on pupils' engagement includes among others that it makes pupils enjoy mathematics lessons; it helps pupils to answer questions in mathematics class and makes pupils feel excited when solving mathematics problems in a well-arranged classroom. The study concludes that a well-maintained classroom environment and diversified teaching methods are crucial for fostering pupil engagement,

particularly in mathematics. Based on the findings of the study, it was recommended among others that schools should actively engage parents and communities in supporting classroom environments by organizing workshops to educate parents about the importance of a conducive learning atmosphere and encouraging community involvement in school activities.

Keywords*: Classroom, learning environment, pupils' engagement, mathematics, primary schools*

Introduction

Primary education is the foundational stage of formal education, vital in shaping the cognitive, emotional, and social development of children. Primary education is a crucial education for children aged 6-11 years plus, it aims to instill literacy, numeracy, effective communication skills, scientific skills, manipulative skills, critical and reflective thinking, among others (Federal Republic of Nigeria, FRN, 2013). It also aims to develop children's ability to function effectively in society within their capabilities, ensuring they are equipped to handle the changing environment. At this stage, learning environment plays a significant role in determining the quality of education that pupils receive. A conducive learning environment encompasses of the physical, psychological, and social aspects of an educational setting, which together create an atmosphere that fosters learning, growth, and development in children.

The concept of the learning environment in primary education refers to the broader context in which learning occurs, including both in-school and out-of-school factors that influence the educational experience. It involves not only the physical space but also the social interactions, teaching methods, and overall atmosphere that surround the learning process (Fraser, 2020). A supportive and well-structured environment encourages active participation, promotes positive behavior, and enhances learning experiences (Dorman, 2018). In primary education, where children are developing foundational skills in literacy, numeracy, and social interaction, the

learning environment must be nurturing, inclusive and stimulating. It should cater for the diverse needs of pupils, including those with different learning styles and abilities (Brady and Harder, 2018). The classroom environment is a more specific aspect of learning environment that focuses on the immediate setting where instruction and learning take place.

Classroom environment is a place designed for children to learn. The classroom environment is also refers to the physical, social and emotional surroundings that influence pupils learning experiences (Akomolafe and Adesua, 2015). According to Moos (2019), the classroom environment can be categorized into three dimensions: relationship, which deals with interactions and communication; personal development, which focuses on the growth opportunities provided; and system maintenance and change, which involves the rules, structure, and organization of the classroom. This includes the physical layout of the classroom, the resources available, the interactions between teachers and pupils, and the pedagogical practices employed. Hattie (2019) buttressed that a supportive classroom environment is characterized by positive teacher-pupil interactions, cooperative learning opportunities, and flexible furniture design. Given the magnitude of the importance of classroom environment to the teaching and learning process, there seem to be environmental standards by which learning environments are established. These standards help to enhance the quality of services provided in schools. Emphasizing on the quality of preschool environments, the Organization for Economic Co-operation and Development (OECD, 2018) noted that, the foundation for learning and continuous development depends on a nurturing and stimulating environment. Therefore, learning environments in primary schools ought to be built and equipped to be learner-friendly, teacher enabling, aesthetically pleasing, and supportive of diverse teaching and learning activities.

A positive classroom environment that is rich in resources, supportive interactions, and effective instructional strategies fosters a sense of belonging and interest among pupils, leading to higher levels of engagement and motivation (Wang and Holcombe, 2020). Research has shown that when pupils perceive their classroom environment as positive and supportive, they are more likely to be engaged in learning activities and motivated to succeed (Patrick, Ryan, and Kaplan, 2017). In contrast, a poorly managed classroom environment with negative teacher-pupil interactions, inadequate resources, and unclear expectations can lead to disengagement, reduced motivation, and even behavioral problems (Klem and Connell, 2018). The classroom environment is not just a physical space but a dynamic setting that significantly impacts pupils' experiences, especially in challenging subjects like mathematics. Research shows that a well-structured environment reduces anxiety, increases enjoyment, and boosts motivation and engagement, especially in challenging subjects like mathematics (Borup, West, and Graham, 2020).

Mathematics is a critical subject in the primary education curriculum, serving as a foundation for problem-solving, logical reasoning, and analytical skills essential for later academic and life success. Mathematics subject is critical to learner's cognitive development, future job choices, as well as the development of the nation and society as a whole. This is because mathematics builds on the learners' numeracy ability. Osaduwa (2018) described mathematics as a subject of figures or science of size and numbers. Osaduwa further referred to mathematics as a universal subject which provides a means of sharpening the mind of an individual, shaping his reasoning ability and developing his personality. The importance of mathematics extends beyond the classroom, as it influences various sectors, including science, technology, engineering, and mathematics (STEM). Mathematics has been made compulsory for children in primary and secondary schools in Nigeria due to the emphasis placed on the subject (FRN, 2013).

Mathematics is often perceived as a challenging subject, deterring pupils from engaging fully and persisting in their studies. Research indicates that a negative attitude toward mathematics can lead to anxiety and a lack of confidence in one's mathematical abilities (Tschannen-Moran and Woolfolk-Hoy, 2021). The motivation for this study stems from the growing concern about the declining performance and interest in mathematics among pupils, particularly in Plateau State. Despite the importance, there is a significant gap in mathematics achievement among pupils, with many struggling to grasp basic concepts and apply them effectively. However, many classrooms face challenges such as overcrowding, inadequate resources, and limited teacher training, which can create an environment that is not conducive to learning (Okwelle and Okeke, 2019). These challenges are exacerbated by socio-economic factors, which further hinder pupils' ability to engage with and be motivated in mathematics (Ikegbusi, Egwu and Iheanacho, 2021). This study explores factor such as engagement as a factor causing this abysmal display of poor achievement of pupils in mathematics.

Engagement in learning involves active participation and investment in the educational process. According to Fredricks, Blumenfeld, and Paris (2018), engagement refers to the observable behaviours of pupils, such as participation in classroom activities, attendance, and effort put into learning tasks. Operationally, pupils' engagement is the extent to which students are actively involved in and committed to their learning. Engaged pupils are more likely to exhibit curiosity, actively participate in discussions, and put forth effort, especially in challenging subjects like mathematics. They encourage critical thinking and creative problem-solving, which is crucial in these subjects (Appleton, Christenson, and Furlong, 2018). Additionally, engaged pupils are less likely to exhibit disruptive behaviours, as their focus is on the learning tasks. In Plateau State, the level of pupils' engagement in mathematics has been a point of concern for educators. It is

therefore against this background that this study seeks to determine the influence of classroom environment on pupils' engagement in mathematics in Pankshin Local Government Education Authority of Plateau State.

Statement of the Problem

In an ideal educational setting, the classroom environment is designed to foster optimal learning, where every pupil feels engaged, motivated, and supported in their academic journey. Specifically, in mathematics, an ideal classroom environment would be one where pupils are actively involved in the learning process, show enthusiasm for the subject, and are motivated to overcome challenges. Teachers in this setting are well-trained, use effective instructional strategies, and create a positive atmosphere that encourages participation, collaboration, and critical thinking. For instance, in an ideal mathematics classroom, pupils would work together in groups to solve complex problems, with the teacher facilitating discussions and providing guidance. The classroom would be equipped with necessary resources such as textbooks, manipulative, and technology that enhance learning. Moreover, the teacher would be attuned to the individual needs of each pupil, offering additional support to those who struggle and challenging those who excel. This environment would promote a love for mathematics and a belief in its relevance to real-world situations, leading to high levels of engagement and sustained motivation.

However, the reality in many classrooms in Plateau State falls short of this ideal. The present situation is marked by several challenges that hinder the creation of an optimal learning environment, particularly in mathematics. Overcrowded classrooms, limited resources, and inadequate teacher training are common issues that adversely affect pupils' engagement and motivation. For example, a mathematics classroom in Plateau State usually have over 50 pupils,

making it difficult for the teacher to give individualized attention or manage the class effectively. This overcrowding leads to a chaotic environment where pupils are easily distracted and disengaged. The researcher's observation affirmed that pupils in public primary schools in Plateau State who struggles with basic arithmetic receive little to no additional support in the current classroom environment. Without intervention, these pupils may continue to fall behind, lose confidence, and eventually disengage from the subject altogether. This scenario is all too common and highlights the urgent need for improvements in the classroom environment. The disparities between the ideal and present situations underscore the critical need for this study.

Purpose of the Study

The purpose of the study is to examine the influence of classroom environment on pupils' engagement in mathematics in Pankshin LGEA of Plateau state. Specifically, the study sought to determine the:

1. Importance of classroom environment on pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State.
2. Influence of classroom environment on pupil's engagement in Mathematics in Pankshin Local Government Education Authority of Plateau State.

Research Questions

The following research questions guided the study.

1. What are the importance of classroom environment on pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State?
2. What are the influence of classroom environment on pupil's engagement in Mathematics in Pankshin Local Government Education Authority of Plateau State?

Methods

This study was conducted to examine the influence of the classroom environment on pupils' engagement in Mathematics in Pankshin LGEA, Plateau State. It was guided by two research questions. The descriptive survey design was employed for the study. The population consisted of 527 public primary school teachers from the 15 public primary schools in Pankshin LGEA. Sample size of 150 teachers were selected through the use of simple random sampling technique. A 24 item structured questionnaire title "Influence of Classroom environment on Pupils Engagement in Mathematics (ICLEPEM)" questionnaire was used for data collection on a 4-point Likert scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Disagree (1 point). The instrument was validated for face and content validity by three experts, two from the Department of Early Childhood Care and Education and one expert from the Measurement and Evaluation unit of the Department of Educational Foundations at the Federal College of Education, Pankshin. Reliability was established using Cronbach's Alpha, with reliability coefficient of 0.87 which shows that the instrument is reliable. The research questions were analysed using the mean statistics where a mean score of 2.50 and above indicated agreed and a mean score below 2.50 indicated a disagreed.

Results

Research Question One: What are the importance of classroom environment on pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State?

Table 1: Mean Ratings of Respondents on the Importance of Classroom Environment on pupils learning of Mathematics in Pankshin Local Government Education Authority of Plateau State.

S/N	Importance of classroom environment on pupils learning of mathematics includes;	Mean	Decision
1	Helping to build pupils confidence in the subject	2.56	Agree
2	Helping to reduce math anxiety among pupils	2.79	Agree
3	Fostering pupils problem-solving skills in any mathematical concept	3.01	Agree
4	Improving pupils critical thinking in mathematics	2.88	Agree
5	Encouraging active learning and participation	2.50	Agree
6	Helping to develop spatial reasoning among pupils in the subject	2.65	Agree
7	Enhancing mathematical communication and collaboration among pupils	2.72	Agree
8	Helping pupils have better understanding and retention of any concept in mathematics	2.89	Agree
9	Increasing pupils' motivation and interest in mathematics	3.05	Agree
10	helping to improve pupils' math achievement and test scores	2.50	Agree
Cluster Mean		**2.75**	**Agreed**

Data analysis presented in table 1 shows the Mean responses of teachers on the importance of classroom environment on pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State. Items 1-10 were all agreed by respondents with mean ranging from 2.50 to 3.05. The grand mean of 2.75 shows that the respondent's agreed that classroom environment is important to pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State.

Research Question Two: What are the influence of classroom environment on pupil's engagement in Mathematics in Pankshin Local Government Education Authority of Plateau State?

Table 2: Mean Ratings of Respondents on the Influence of Classroom Environment on Pupils' Engagement in Mathematics in Pankshin Local Government Education Authority of Plateau State.

S/N	Influence of classroom environment on pupils' engagement in mathematics includes;	Mean	Decision
11	Making pupils to enjoy mathematics lessons	2.67	Agree
12	Helping pupils to answer questions in mathematics class	2.51	Agree
13	Pupils feel excited when solving mathematics problems in a well-arranged classroom	2.64	Agree
14	Enabling pupils pay attention when the teacher explains mathematics concepts	2.95	Agree
15	Classroom arrangements make pupils participate in mathematics activities	2.52	Agree
16	Helping pupils ask questions when they do not understand any concept in mathematics	2.37	Disagree
17	Pupils work on mathematics exercises by themselves when the classroom environment is well organized	2.39	Disagree
18	Helping pupils to collaborate with their classmates during mathematics group work	2.61	Agree
19	Making pupils to feel proud when they get correct answers in mathematics	3.01	Agree
20	Bringing about teacher-pupil relationship	2.55	Agree
21	Developing pupils confident to solve mathematics problems	2.85	Agree
22	Helping pupils use context in real world situation	2.47	Disagree
23	Providing hands-on activities and manipulative for pupils	2.59	Agree
24	Classroom environment gives pupils autonomy	2.50	Agree
	Cluster Mean	**2.61**	**Agreed**

Data analysis presented in table 2 shows the Mean responses of teachers on the influence of classroom environment on pupil's engagement in Mathematics in Pankshin Local Government Education Authority of Plateau State. Items 11, 12, 13, 14, 14, 18, 19, 20, 21, 23, and 24 were agreed by respondent with mean scores 2.67, 2.51, 2.64, 2.95, 2.52, 2.61, 3.01, 2.55, 2.85, 2.59 and 2.50 respectively as the influence of classroom environment on pupils' engagement in

mathematics. Items 16, 17 and 22 were disagreed by respondents with mean 2.37, 2.39 and 2.47 which are below the decision mean of 2.50. The grand mean of 2.61 shows that the respondent's agreed that classroom environment influences pupils' engagement in mathematics in Pankshin Local Government Education Authority of Plateau State.

Discussion of Findings

Findings of the study revealed that respondents agreed to the importance of classroom environment on pupils learning of mathematics in Pankshin Local Government Education Authority of Plateau State. Some of the importance are; it improves pupils critical thinking in mathematics, and it encourages active learning and participation among others. These findings tally with Ikegbusi, Egwu and Iheanacho (2021) who posits that the type of classroom environment that a teacher creates and encourages has a significant importance to either increase or decrease pupils' ability to learn and feel comfortable as a member of the class. They further posited that the classroom environment should as much as possible foster cooperation among pupils. Findings also agrees with that of Wang and Holcombe, (2020) who posits that a positive classroom environment that is rich in resources, supportive interactions, and effective instructional strategies fosters a sense of belonging and interest among pupils, leads to higher levels of engagement and motivation of pupils. It is therefore important that classroom learning environment should be well arranged and in good order in to improve teaching and learning of pupils and also increase pupils' engagement in mathematics.

Findings of the study also revealed that teachers agreed to the influence of classroom environment on pupils' engagement in mathematics in Pankshin Local Government Education Authority of Plateau State. The influence of classroom environment on pupils' engagement includes; it makes pupils enjoy mathematics lessons, it helps pupils to answer questions in

mathematics class, pupils feel excited when solving mathematics problems in a well-arranged classroom among others. This aligns with the findings of Baker et al. (2020), who posits that a well-maintained classroom environment significantly enhances pupils' engagement and academic performance. Similarly, Li, Lin and Wang (2020), posits that cooperative and collaboration have shown significant promise in promoting engagement, particularly in mathematics. This finding resonates with Newman, Alsharif and Tindal (2019), who posits that innovative and engaging instructional methods are essential to fostering a positive attitude toward Mathematics, especially among boys who may be experiencing external pressures that deter engagement. A well arranged and designed classroom environment will motivate pupils to learn as well as engage them in the classroom. Mathematics teaching will be interesting to the pupils with a good classroom environment. It is therefore, important that teachers take all of these into consideration when teaching pupils mathematics to create an interest in them as well as engage them into learning.

Conclusion

This study investigated the influence of the classroom environment on pupils' engagement in Mathematics within Pankshin LGEA, Plateau State. The findings indicate that classroom environment is important in teaching mathematics to pupils. Moreso, classroom environment influences pupil's engagement in mathematics. In summary, the classroom environment plays a crucial role in influencing pupils' engagement in Mathematics, and enhancing these conditions is essential for fostering positive attitudes and performance in Mathematics.

Recommendations

Based on the findings of this study, the following recommendations were made

1. Continuous professional development programs should be provided for teachers, focusing on effective classroom management and engaging instructional practices, as well as

training in emotional intelligence and the ability to recognize and address individual pupil needs to create a more inclusive learning environment.

2. Schools should actively engage parents and communities in supporting classroom environments by organizing workshops to educate parents about the importance of a conducive learning atmosphere and encouraging community involvement in school activities.

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PERCEIVED IMPACT OF DIFFERENTIATED INSTRUCTION ON THE LEARNING OUTCOMES OF SLOW LEARNERS IN IKWUANO LOCAL GOVERNMENT EDUCATION AUTHORITY OF ABIA STATE

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Abstract

This study investigated the perceived impact of differentiated instruction on the learning outcomes of slow learners in Ikwuano Local Government Education Authority of Abia State. Three research questions guided the study. Descriptive survey research design was adopted to carry out the research. The population of the study constituted 696 public primary school teachers in the 58 public primary schools in the study area. Simple random sampling technique was used to select 150 primary school teachers from the total population. The instrument for data collection was a 28-item structured questionnaire titled "Questionnaire on the Perceived Impact of Differentiated Instruction on the Learning Outcome of Slow Learners" (QPIDILOSL) developed by the researcher. The reliability was established using Cronbach alpha and the test yielded reliability coefficient of 0.78, 0.80 and 0.80 respectively. The overall reliability co-efficient of the instrument was 0.79. Mean was used for the analyze the data. The result of the findings revealed that differentiated instruction positively impacts the learning process and learning outcomes of slow learners in primary schools. The findings identified teachers' lack of skills, large class size, inadequate resources, among others as the challenges facing the implementation of differentiated instruction. The findings also revealed that organizing workshops and seminars for teachers, allocation of adequate funding, among others are the possible solutions to the challenges facing the implementation of differentiated instructions in primary schools. Based on the findings, the researcher recommended that authorities should provide teachers with professional development on the effective use of differentiated instruction approach for an improved educational outcome of slow learners among others.

***Keywords**: Differentiated instruction, learning outcomes, slow learners*

Introduction

Education is an indispensable tool for national development. The development of several nations of the world could be traced to their quality of education. Ugwude and Okika (2017) posited that education worldwide is a complex process of socialization that transforms individuals into social beings equipped with the necessary tools to participate fully in the dynamics of life. Education involves the process of transforming individuals through transfer of knowledge, morals, skills and values. Education is achieved and attained through the help of quality teachers. Teachers are indispensable human resources that plays significant role in the educational process and helping the society to raise people irrespective of their different abilities.

Slow learners are regarded as learners who are unable to cope with the school task as normal learners of the same age would cope. Slow learners are those who have low cognitive abilities as a result, experience low processing of information. Muppudathi (2014) defined slow learners as pupils who have ability to gain all the necessary academic skills with the exception that their depth and rate is below that of an average learner. Borah, (2013) stated that slow learners are the ones with slightly below average cognitive abilities. Due to this they may fail to excel in some subjects or classes. This does not necessarily mean that they have any intellectual disability. They are normal learners who cannot study under traditionally accepted educational system.

Slow learning is not a sign of low intelligence but rather a different pace of learning. Slow learners' assimilate educational content at a very slow pace while learners with disabilities have an impairment that makes learning difficult to learn. Rekah et al (2013) opined that slow learners have cognitive abilities below average, but cannot be called a disability. Slow learners

are characterized by their learning pace, assimilation, retentive ability and average or poor performance in most cases. Furthermore Patrick (2022) viewed slow learners as pupils who learn at a pace a little behind others of their age and grade level, however academic subjects are a challenge to them. According to Reddt as cited in Alhammudin, Rohman and fanani (2022), slow learners With an IQ of 80-90 are slower in capturing material in the form of symbols, abstracts, or conceptual materials. Although slow learners may have special educational needs, they do not fit into the special education services, under the category of intellectual disability.

The researcher defines slow learners as pupils who take longer time to assimilate and understand new information or skills compared to their peers. These pupils may need more time, repetition, and support to fully comprehend lesson, but can still achieve success with the right guidance and instructional strategies. The issue of slow learners as a concern to teachers has attracted the attention of parents, school administrators, curriculum developers and even researchers. Several result and strategies has been identified to enhance the learning process, learning outcome and academic performance of slow learners. These strategies include the use of individualized instruction, continuous assessment, use of graphic organizers, differentiated instructions, and among others.

Differentiated instruction is one of the teaching approach or methods that are used by teachers to meet the needs of learners. Kado, Dorji, Dem and Om, (2021) opined differentiated instruction as a modified instruction that help pupils with diverse needs and learning to master challenging academic content. Roy, Guay and Valois (2014), see differentiated instruction as a proactive and deliberate adaptions of the content, process, product, learning environment or learning time, based on the assessment of pupils' readiness or other relevant pupil characteristic

such as learning preference or interest. From the foregoing, it could be deduced that differentiated instruction is a teaching approach that takes into consideration the diverse needs of each learner. In addition Adebayo and Shumba (2014), opined that differentiated instruction is a strategy of teaching that required the teacher to have full academic achievement knowledge, including the learning needs of all pupils in their classroom. Differentiated instruction recognizes the fact that "one size fits all" approach does not benefit diverse learners. Weselby (2014) viewed differentiated instruction to mean teaching the same content to learners using varied strategies that appeal to the needs of learners or varying the level of difficulty of content based on the ability of each learner.

The first area in which the teacher will differentiate is the curricula content. Tomlinson and Moon, (2013) states that teachers can adopt the use of differentiate instruction based on learners' learning profiles, readiness level, and interests through content, process, product, and learning environment. It constitutes of the knowledge, concepts, and skills that pupils must learn from the curriculum. According to Tomlinson and Moon (2013), diversifying the information entails employing a variety of delivery modalities such as videos, texts, lectures, audio, visual presentations, and so on. Pupils are given a chance to learn information based on their preferences for delivery technologies or formats. According to Sebihi, (2016), teachers must adapt the same material to all learners while utilizing a variety of instructional techniques to deliver the subject.

The process is the second area in which teachers can differentiate. According to Tomlinson and Moon (2013), the process is how learners take in and make meaning of the material. Teachers must create or use a variety of instructional techniques to suit the diverse

learning requirements, learning profiles, and interests while differentiating the contents. According to Aliakbari and Haghighi (2014), the procedure can be differentiated by the teacher utilizing various instructional techniques such as tiered instructions, flexible grouping, and tiered assignments. The third area to differentiate is the product. It is how pupils demonstrate what they've learnt. A teacher can Differentiate the product by giving liberty for students to show their final product of learning Teacher can design the Following assessment strategies to differentiate the product; Enabling students to decide how they want to Demonstrate their learning; (b) using graded assessment scales to monitor and assess student skills; (c) allowing Students to choose whether they want to work in groups or independently on their product; (b) Encouraging students to create their own original work.

The learning environment is the fourth area to differentiate. According to Magableh and Abdullah (2020), the learning environment refers to the many Places, situations, and cultures that make up the actual classroom setting in which students learn. To differentiate the learning environment, teachers need to consider the different learning contexts. This is a significant approach for pupils to enhance their ability to learn. The studies of several authors has identified the benefits attached to the use of differentiated instruction in the learning process, outcome and overall performance of learners. The benefits of differentiated instruction include improved learners engagement, motivation, learning outcome and overall academic performance of learners. Ismail and Allaq (2019) states that educators using differentiated instruction combined with child-centred learning strategies found positive outcomes of learners' successful learning skills and experiences, classroom engagement, learning interests or social interaction. While there are several benefits of differentiated instruction, its impact on the learning outcome of slow learners is one of the core aims of this study.

Differentiated instruction as a child-centered learning approach creates a learning environment that supports the effective teaching and learning process, which can enhance pupils' engagement, motivation, learning outcome and overall academic performance. Ismail and Allaq, (2019) states that educators emphasized that differentiated instruction places learners in the centre, provides opportunities for higher order thinking and group collaboration to solve problems, and changes learners from passive acquisition of knowledge to an active learning process through learner-centred teachings such as teamwork learning, problem-based learning or project-based learning.

Slow learners assimilate and grasp educational contents in a slow pace, hence they need an instructional method that focuses on them and addresses their limitations towards learning. Differentiated learning approach provides several learning opportunities that are capable of enhancing the learning outcome of slow learners. Ismail and Allaq, (2019) states that the combing uses of differentiated instruction and learner-centered teaching strategies provide opportunities for learners to transform their learning behaviour. On a similar note, Ismail and Allaq (2019) stated that educators using differentiated instruction combined with child-centred learning strategies found positive outcomes of learners' successful learning skills and experiences, classroom engagement, learning interests or social interaction. These benefits can result to a better learning experience, outcome and overall academic performance among slow learners.

Several researches on this subject have revealed the impact differentiated instruction has on the learning outcome of slow learners. According to Hapsari and Dahlan, (2018) studies applying differentiated instruction in mixed-ability classrooms revealed that learners

significantly and positively improved their learning achievements. Sapan and Mede, (2022) also reported that published studies that applied differentiated instruction among learners reported that learners enhanced their learning interests, developed independence and autonomy towards their learning, grew positive attitudes towards the course and were satisfied with the classes and course design. From the results and outcome of these authors, it could be deduced that differentiated instructional approach is instrumental in slow learners' motivation, learning process, learning outcome and overall academic outcome Despite the several benefits differentiated instruction has on the learning outcome of slow learners, there are challenges and barriers that limit the effective utilization of the instructional method. For instance knowledge gap among teachers, according to Zegeye (2019),report teachers are generally aware of differentiated instruction, but lack knowledge of the content, methodological format ,objective and how to assess using differentiated instruction. These challenges affect teachers' utilization of differentiated instruction and affecting their learning outcome in meeting the individual learning needs of primary school pupils, including the slow learners

Learning outcome is a concept that describes the skills, knowledge and attitude demonstrated by pupils after being an active participant of a teaching and learning process. The skills and knowledge exhibited by pupils following an instructional process is known as learning outcome. Susanto, (2015) defined learning outcome as the result of someone participating in teaching and learning activities that have been carried out over a certain period. Susanto further stated that learning outcomes are abilities obtained after carrying out learning activities, to get learning achievements. Ntombiyendaba, (2015) posited that learning outcome is what is achieved after a pupil has undergone certain experiences at the learning institution. Furthermore, Ugenyi

(2018) stated that learning outcome can also be seen as the outcome (in scores or grades) of learners after they have been exposed to classroom instruction.

The primary level of education is a significant level of education as it lays the foundation for a child's academic journey, and it is crucial to ensure that every pupils regardless of their learning pace, receives the necessary support and guidance. Every classroom in a primary school is made up of different learners based on their level of intelligence and performance. These different learners include slow learners who struggle to keep pace with their peers academically. In recent years, differentiated instruction has emerged as a potential approach to addressing the diverse learning needs of pupils, particularly those who are identified as slow learners. Differentiated instruction has been widely advocated as an effective strategy for addressing diverse learning needs, its specific impact on the learning outcome of slow learners remains an area requiring further investigation. Therefore there is need for an analytic examination of the perceieved impact of differentiated instruction on the learning outcomes of slow learners in Ikwuano Local Government Education Authority of Abia State. To achieve this purpose, the study answered the following questions;

1. What are the benefits of differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority?
2. What are the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano local Government Education Authority?
3. What are the solutions to the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority?

Methods

Descriptive survey design was adopted for this study. The study was carried out in Ikwuano Local Government Education Authority. The population of the study consisted of all the 696 teachers in the 58 government primary schools in Ikwuano Local Government Educational Authority of Abia State . The sample size was 150 primary school teachers. The research instrument for the study was a questionnaire, designed by the researcher. The instrument was titled "Questionnaire on the Perceived Impact of Differentiated Instruction on the Learning Outcome of Slow Learners" (QPIDILOSL). The instrument consists of sections A, B, C and D. Section A sought information on respondents' personal data. Section B contained question items on the benefits of differentiated instruction on the learning outcomes of slow learners in primary schools. Section C contained question items on the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools and Section D contained question items on the solution to the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools. The questionnaire instrument contained 28 question items in three subsections which were structured on a four point rating scale of Strongly Agree (SA) =4, Agree (A) =3, Disagree (D) =2 and Strongly Disagree (SD) =1.

To ascertain the validity of the instrument, three copies of the questionnaire including the title, purpose of study and research questions were given to three experts. Two experts in the Department of Early Childhood and Primary Education and one expert in Measurement and Evaluation Unit from the Department of Educational Foundations, both from the Faculty of Education at Nnamdi Azikiwe University, Awka. The Cronbach alpha method was used to

establish the reliability of the instrument. This was done first by administering the questionnaire to a similar group of teachers in Umuahia North Local Government Area which is outside the study area. The internal consistencies of the items in the clusters were determined using Cronbach statistics. The alpha coefficients gotten were 0.78, 0.80 and 0.80 for section B, C and D respectively, with an overall coefficient of 0.79 and these were adjudged adequate, and the instrument reliable. The instrument was administered to the respondents by the researcher with the help of two research assistants who were duly trained on how to administer the questionnaire.

Data obtained was analyzed using mean. A mean of 2.50 was used as the cutoff point for making decisions. The decision rule was that any item that scored a mean of 2.50 and above would be seen as having attracted positive responses and was agreed, while items that scored less than 2.50 would be regarded as having attracted negative responses and was disagreed.

Results

Research Question One: What are the benefits of differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority?

Table 1: Mean Rating of Respondents on the Benefits of Differentiated Instruction on the Learning Outcomes of Slow Learners in Primary Schools

S/N	Perceived impact of differentiated instruction on the learning outcomes of slow learners;	Mean ($\bar{X}$)	Decision
1.	Differentiated instruction improve the academic performance of slow learners	3.06	Agree
2.	It increases engagement/participation of slow learners in academic activities	3.08	Agree
3.	It enhances self-esteem and confidence of slow learners	2.95	Agree
4.	Differentiated instruction help in the development of individual strengths of slow learners	3.02	Agree
5.	It improves slow learners' retention of information	2.90	Agree
6.	It enhances slow learners' critical thinking skills	2.80	Agree
7.	Differentiated instruction creates a more positive experience for slow learners	3.03	Agree
8.	It promotes slow learners' problem solving skills	3.01	Agree
	Cluster Mean	**2.98**	**Agree**

The analysis in Table 1 above shows that item 1-8 had mean scores above the cutoff point of 2.50 mean score, with 2.98 as the cluster mean. This suggests that the teachers agree that items 1-8 are the benefits of differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority.

Research Question Two: What are the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano local Government Education Authority?

Table 2: Mean Rating of Respondents on the Challenges of Implementing Differentiated Instruction on the Learning Outcomes of Slow Learners in Primary Schools

S/N	Challenges of implementing differentiated instruction;	Mean ($\bar{X}$)	Decision
9.	Teachers lack of skills in the use of differentiated instructions	3.12	Agree
10.	Large class size affects teachers utilization of differentiated instruction	3.01	Agree
11.	Lack of adequate resources for differentiated instructions in schools	2.96	Agree
12.	Time constraints in utilizing differentiated instruction in the classroom	2.98	Agree
13.	Poor curriculum that supports the use of differentiated curriculum	3.00	Agree
14.	Difficulty in identifying and accessing individual needs of slow learners	3.21	Agree
15.	Disparity in learning styles of slow learners	2.86	Agree
16.	Difficulty in measuring pupils' progress	2.23	Disagree
17.	Lack of parental involvement in the educational process of slow learners	3.01	Agree
18.	High parental expectations towards pupils' learning and improvement	3.03	Agree
	Cluster Mean	**2.94**	**Agree**

The analysis in Table 2 showed that item 9-15, 17 and 18 had a mean score above the cutoff point of 2.50 with 2.94 as the overall cluster mean. This indicates that the teachers agreed that item 9-15, 17 and 18 are the challenges of implementing differentiated instruction in primary schools. However, the teachers disagreed that item 16 with a mean score of 2.23 is not a challenge of implementing differentiated instruction in.

Research Question Three: What are the solutions to the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority?

Table 3: Mean Rating of Respondents on the Solutions to the Challenges of Implementation of Differentiated Instruction on the Learning Outcomes of Slow Learners in Primary Schools

S/N	Solution to the challenges of implementing differentiated instruction	Mean	Decision
19.	Organizing workshops and seminars for teachers' on the effective use of differentiated instruction	3.24	Agree
20.	Allocation of adequate fund to ensure the availability of materials for differentiated instruction	3.28	Agree
21.	Use of appropriate class size	3.19	Agree
22.	Assigning additional support staff	3.20	Agree
23.	Modification of the curriculum to accommodate the use of differentiated instructions	3.24	Agree
24.	Use of collaborative learning	2.84	Agree
25.	Utilization of Individual Education Plans (IEPs)	3.12	Agree
26.	Use of diverse learning styles in teaching slow learners	2.99	Agree
27.	Use of flexible assessment methods	3.01	Agree
28.	Involvement of parents in the educational process of pupils	3.21	Agree
	Cluster Mean	**3.13**	**Agree**

The analysis in Table 3 shows that item 19-28 had mean scores above 2.50 which is the cutoff point and 3.13 as the cluster mean. This reveals that the teachers agreed that item 19-28 are the solutions to the challenges of implementing differentiated instruction on the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority.

Discussion of Findings

The findings of this study are discussed based on the research questions that guided the study:

The finding of this study revealed that differentiated instruction positively impacts the learning process and improve the learning outcomes of slow learners in primary schools in Ikwuano Local Government Education Authority. This finding is in harmony with Liou, Cheng, Chu, Chang, and Liu, (2023) which revealed that that the differentiated instruction increased students' learning interests, promoted focused and independent thinking, and enhanced academic achievement. The finding is also in consonance with Lester, (2023) which indicated that the students who received differentiated instruction made a significant gain in achievement; according to the data, the 2nd Perio d class (receiving differentiated instruction) outperformed the 3rd period class (receiving no differentiated instruction). Furthermore, the findings of this study agrees with Ismail and Allaq, (2019) who states that educators emphasized that differentiated instruction places learners in the centre, provides opportunities for higher order thinking and group collaboration to solve problems, and changes learners from passive acquisition of knowledge to an active learning process through learner-centered teachings such as teamwork learning, problem-based learning or project-based learning.

Furthermore, the finding also identified teachers' lack of skills, large class size, inadequate resources, time constraints, disjointed curriculum, difficulty in identifying slow learners needs, disparity in learning styles, disparity in learning styles, lack of parental involvement and high parental expectations towards pupils' improvement as the challenges facing the implementation of differentiated instruction in primary schools. The finding of this

study agrees with Zegeye, (2019) who reported that teachers are generally aware of differentiated instruction, but concerns such as content differentiation, methodological differentiation, objective differentiation, and assessment differentiation are less understood. The finding of this study is also in alignment with Onyishi and Sefotho, (2020) who states that many teachers failed to do much in their class room and complained of time and lack of materials, therefore rarely use differentiated approach.

Moreover, the study also revealed organizing workshops and seminars for teachers, allocation of adequate funding, use of appropriate class size, assigning additional support staff, modification of the curriculum, use f collaborative learning, utilization of Individual Educational Plans (IEPs), use of flexible assessment methods and the involvement of parents in the education of pupils are the possible solutions to the challenges facing the implementation of differentiated instructions in primary schools. The finding of this study is in harmony with Mohammed, (2021) who recommended that school administrators should organize in-service programmes, seminars, short courses and workshops on the implementation of differentiated instruction to help increase early grade teachers' understanding of differentiated instruction and their awareness of the efficacy of its practice. The finding of this study also aligns with Zegeye, (2019) who proposed that effective implementation of differentiated instruction relies on teachers' knowledge of the concept of differentiated instruction and attitudes towards differentiated instruction; Zegeye further mentioned that the teacher's willingness, commitment, preparation, and support are critical to the success of differentiated instruction.

Conclusion

This study concluded that the differentiated instructional approach is significant and positively impacts the learning process and learning outcome of primary school pupils who are slow learners. It is hoped that the implementation and utilization of differentiated instruction will enhance the learning process, learning outcome and overall academic achievement of zslow learners in primary schools.

Implications of the Findings

The study revealed that differentiated instruction positively influence the learning process and the overall learning outcome of slow learners in primary schools. This finding has an implication for improving teachers training, educational policy, allocation of educational resources, and teaching practices to ensure the utilization of differentiated instructional approach for an improved learning outcome of slow learners in primary schools.

Recommendations

Based on the findings of this study, the researcher made the following recommendations.

1. Educational authorities should provide teachers with professional development on the effective use of differentiated instruction approach for an improved educational outcome of slow learners.
2. School administrators should encourage and support teachers' utilization of differentiated instructional approach to enhance the learning outcome of slow learners.
3. Curriculum developers should modify the academic curriculum in order to accommodate the utilization of differentiated instructional approach in primary schools.

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